

RISK COMMUNICATION AND GOVERNMENT

Theory and Application for the Canadian Food Inspection Agency

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This paper was designed to explore risk communication from a government perspective including a review of some of the recent theory on risk communication with a focus on food risk and science-based communication. The objective of the paper is to provide a baseline of understanding of risk communication in government, to bridge gaps with respect to risk communication and aspects of risk management, and to improve the CFIA's overall risk communications strategies and activities.

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EXECUTIVE SUMMARY

The objective of this document is to provide a review of current theory on risk communication and to propose a model for food risk communication for the Canadian Food Inspection Agency (CFIA). Risk communication has been described by Dr. Ortwin Renn, a leading researcher in the area of risk communication, as being characterized by three main elements; informing (changing knowledge), persuading (changing attitude and behaviour) and consulting.

Defining the regulatory agency environment

Many writers have demonstrated that there are certain very specific conditions and constraints applied to communications from government, which in turn determine the range and scope of activities that a regulatory agency of government can undertake in the area of risk communication.

The relationship between governments and citizens has evolved. The former Clerk of the Privy Council of Canada spoke of a “democratic revolution” in which people want to play an active role in the decisions that affect their lives. Part of this is a consequence of a better informed and better educated public, but it is also due to a sense of disenfranchisement among the public. Citizens are no longer deferential to authority and unquestioning of information from government. Even scientific authorities come into question today.

Citizen engagement is seen as a means to involve the public in government decision-making. Obstacles exist, however, in the form of resource availability, and in the lack of confidence exhibited by citizens in governments today. Specific to communication based on science is the fact that the public no longer regards science advice as “certain”. Public messages, particularly those based on science, are challenged by the fact that the public may not understand mathematical probabilities and communicators may not understand the process and importance of message framing. As a result, the public and regulators commonly arrive at different understandings of risk.

The mandate of the Canadian Food Inspection Agency is to deliver all federally regulated food inspection and quarantine services as well as plant protection and animal health programs. The CFIA reports to Parliament through the Minister of Agriculture and Agri-Food.

The complexity of today’s food chain means that responsibility for food safety must be shared, which the CFIA does through partners in provincial/territorial governments, other federal departments, food producers, industry, distributors, retailers, and ultimately every consumer of food in Canada.

The agency has developed its own risk analysis framework based on the Risk Analysis Model adopted by several international organizations.

Theoretical aspects of risk communication

Public attitudes about risk are an important aspect of risk management. Much research has been done on public opinion and how it develops; several models are available to track the evolution of a widely held attitude from “raw opinion”.

The media plays an important role in risk communication and the formation of public views, not only by providing information but also by bringing issues to the attention of the public, even creating a sense of urgency. Factors that “trigger” media coverage have been explored and described.

Generic models for communication have been developed. The traditional view is that the public sees estimates of risk as incontrovertible; however, this may no longer be true, given the democratic view which has mutual understanding as its goal. The democratic view proposes a two-way exchange of information. As a result, participatory democratic values now shape the way risk communication is done.

Risk communication has evolved from the field of risk analysis and thus has a limited basis in the field of communications as such. Risk communication has been defined as an interactive process of an exchange of information, involving multiple messages about the nature of risk.

Risk communication will not, even when effectively used, solve all problems or resolve all conflict on issues. On the other hand, poor or absent communication will almost certainly lead to a failure to manage risk effectively.

Two essential components to risk communication are trust and perception. Building trust is the pivotal focus of risk communication which is problematic for government and government agencies as the public tends to see government as a less-than-trusted source of information. Perception, which emerges from a combination of complex factors, is an area under constant study. The public and experts seldom agree in their perceptions of risk. Value systems shape general attitudes towards risk and combine with other factors such “dread factors” to determine how individuals will react to risk.

Aspects of science-based communication

Communicating about science poses a particular challenge for risk communicators. Policy-makers and scientists are often reluctant to present the public with complex, technical scientific information, as in the case of bovine spongiform encephalopathy (BSE) in the United Kingdom, as they are sure it will be misunderstood or misinterpreted.

In a public risk management framework, input from both the scientific and the public contexts ensures a more complete range of information. The evolution of risk communication from one-way to two-way communication is critical in cases where scientific uncertainty is a predominant characteristic. Including both expert and lay perspectives in the decision-making process

becomes the cornerstone of effective policy-making.

Communicating about food

Theories on communication and risk communication are plentiful, but communication about food can have very specific characteristics. The public tends to assess risk based on specific context, and where food is concerned, risk is not well tolerated because the public is more dependent on food than on any other commodity.

In the absence of media coverage, for example, or public messages about food risk, the public tends to be apathetic about risk on a day-to-day basis.

From theory to application

Theory provides much needed insight which forms the basis for a risk communication strategy, but application of theory is often subject to operational realities and constraints.

Risk communication is an integral part of risk management and risk analysis; it is not an “add-on”. Communication informs thinking throughout the risk analysis process. One of the challenges of implementing this new philosophy is the need for culture shift which embraces the concepts of openness, responsiveness, public perception, trust, participation and ethical issues. Governments, as already noted, face a number of challenges including the fact that they are not always seen as a trusted source of information.

In addition, while governments may share responsibility for risk management decisions, assigning responsibility is complex and limited by statutes and political responsibility.

Government risk communicators must be prepared for situations in which the public chooses to hold federal ministers responsible for risks, even those for which they have no real responsibility. Involving citizens in decision-making means that authority is shared in the decision-making process, but the government cannot share responsibility.

Openness and “transparency” are more than the transfer of information; presenting facts alone does little to bridge the gap between the public’s actual and subjective perception of risk, and does not lead to fulfilment of the goal of citizen engagement, which is mutual understanding.

Thus, risk communication goals should reflect a two-way exchange of information leading to a common approach to discussion of issues and a common influence on risk decisions. If the public perceives it is being manipulated, loss of trust and even public outrage will be the outcome.

A model for risk communication

Dr. Ortwin Renn of Germany, a leading risk communications theorist, has developed a model of policy-making that incorporates the concept of deliberation and the principles of deliberative

processes. He identifies four key elements: markets, expertise, regulatory regimes, and, last, public discourse. The essential concept behind the model is that mutual understanding and consensus-building are the best ways to address the elements of values and fairness in risk decision-making.

Theory dictates that a successful model for risk communication must reconcile the views of scientists, the public and politicians in order to achieve a common understanding of complex risks, leading to credible management options and credible policy development around risk.

The CFIA has adapted a model prepared by the Assistant Deputy Minister Working Group on Risk Management, highlighting communications as an integral aspect within each phase of decision-making.

The communications challenges identified were:

- the importance of perception or assessments;
- the degree of public tolerance of risk;
- the role that pro-active risk communication can play in building public understanding of risk and management of risk; and
- the need to gain/maintain public trust, and its impact on the credibility of government messaging.

Developing a single model to embrace all aspects of the nature of decision (from single food recall situations to policy-making decisions to high visibility and controversial issues management) and all aspects of communication strategy is an impressive challenge.

The CFIA risk analysis model shows a natural flow of risk communication decisions. Having decided on the level of risk debate, the risk communicator must then turn to the mechanics of the risk communication process and focus on methodology, tools, channels and communications products.

Much of the effectiveness of the CFIA's food risk communication is based on the alliances forged between the agency and its many partners, including stakeholders, governments at all levels and special interest groups.

Risk communication is a complex and emerging field. Practitioners are quick to point out that no one form of risk communication will satisfy everyone, but it is possible to align theory in a predictable way and thus, build an effective communication strategy.

As the authors explored theory and practice in risk communication, a single point appeared repeatedly—the issue of trust and credibility. Clearly, the relationship between the source of the communication and the recipient must be acknowledged as an important factor in effective risk communication, if not the most important factor.

Successful risk communication is not about giving out information or about making stakeholders

understand. Today, successful risk communication can result only when the quality of debate among government, the public and all stakeholders is improved.

1.0 INTRODUCTION: SETTING THE STAGE

The objective of this paper is to review current theory on risk communication and to propose a model for food risk communication within the Canadian Food Inspection Agency (CFIA).

While it must be recognized that the CFIA's mandate extends beyond the realm of food safety and food inspection, we would like to stress that this paper will focus on issues associated specifically with risk communication about food, and the realities of risk communication for a government agency.

Many writers and researchers have shown that certain very specific constraints and realities apply to communications from government. These are hurdles that must be recognized before they can be effectively managed. We will first attempt to clearly define the situation within which a government agency such as the CFIA operates. This sets out the practical realities within which the CFIA undertakes its risk communication activities.

Technology and globalization are important factors in the evolution of risk communication strategies. Rapid technological advances in communications tools are increasing both the speed of information flow, to and from the source and recipient, and the scope of the audience. This results in acceleration of the development of social attitudes and risk perception.

Research has shown that public perceptions of risk are constantly changing and evolving as the dynamics of public opinion shift in response to the environment in which we all live. Results of research into the factors influencing the evolution of public opinion will most certainly help to structure, develop and evolve communication strategies related to risk.

Governments worldwide are beginning to recognize that the traditional methods of engaging citizens in policy-making are not always effective. For example, consultation is a process that often represents no more than a snapshot of public opinion at a particular moment in time. Traditional methods of communicating risk which are generally associated with the "technical view" of risk communication or the "factual information model" as elaborated by Gutteling,⁽¹⁾ are no longer considered to be the best and only means of developing public policy around risk. It is now recognized by authorities at all levels that a genuinely deliberative and interactive citizen engagement is a more effective means of managing risk. For government this will entail adjustments in the way it interacts with the public.

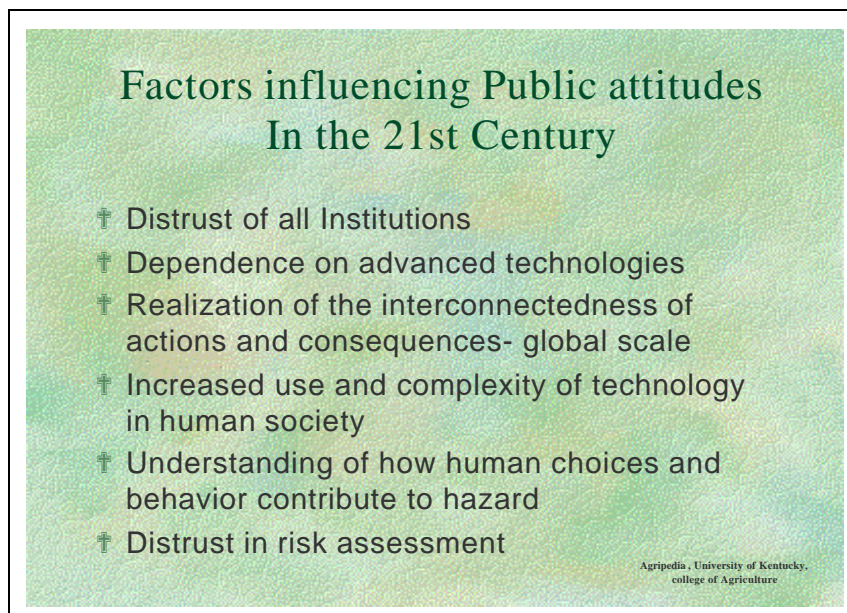
1.1 Five factors defining the environment

1.1.1 The global village

“We are all members of a single global village,” wrote Canadian communications theorist Marshall McLuhan in *The Medium is the Message*. “The electronic media bring us in touch with everyone, everywhere, instantaneously.”

Today, globalization “is more than a catch phrase”, wrote Donald J. Savoie in *Governing from the Centre*. “The emergence of global corporations and new trade, financial and communication links are dramatically changing the policy context for national government in a shrinking world.”

The International Monetary Fund (IMF) which plays an important role in undertaking surveillance of the international economy and in the policies of its 182 member countries, has defined economic globalization as the “increasing integration of economies around the world, particularly through trade and financial flows.” The term sometimes also refers to the movement of people (labour) and knowledge (technology) across international borders. Broader cultural, political and environmental dimensions of globalization also exist.



Former president of the Canadian International Development Agency, in a lecture at the Canadian Centre for Management Development in 1993, explored the significant impact of external forces on the traditional role of government. He recognized that these forces have taken on international dimensions such as the inter-penetration of markets, the free flow of capital, and the globalized problems of environment, migration, international terrorism and epidemics.⁽²⁾

Domestic governments are faced with other pressures, through the evolution of the “information society”. People are better educated and have greater access to information through vehicles such

as the Internet and 24-hour news, for example. A better informed and educated public is far less likely to accept direction from authority without question when it affects their day-to-day lives. The public is becoming increasingly aware of food, nutrition and the possibility of risk to the food supply, and is demanding more information. The desire of so many citizens and groups to be consulted and to participate in public-sector decision-making processes has created a need that has not yet been fully met, and which can only be met through a more in-depth consultative process between those who govern and those who are governed.⁽²⁾

1.1.2 New relationships between government and citizens

The Social Union Framework Agreement, which acts as an umbrella under which governments will concentrate their efforts to renew and modernize Canadian social policy, and the emergence of citizen engagement embody the new relationship between government and its citizens.

“We realize that our written and unwritten Constitution defines much of what Canada is all about - especially parliamentary democracy, federalism and a Charter of Rights. For public servants, this means that it is fundamental to respect the authority of elected governments, the roles and responsibilities of provincial governments, and the rights and freedoms of Canadians.”

A Strong Foundation

Report of the Task Force on Public Service

Values and Ethics, (1997) Canadian Centre for Management Development (CCMD)

a. Social union and citizen engagement

Canada’s public environment is characterized by a new relationship between the federal government and Canadian citizens. The Canadian “Social Union Framework Agreement” (SUFA), signed in February 1999, is an agreement between the Government of Canada and the provincial and territorial governments. This agreement sets out a cooperative relationship between levels of government that promises to manage their interdependence while at the same time respecting constitutional jurisdictions.

Public values and views around governance are changing. Jocelyne Bourgon, former Clerk of the Privy Council, describes current events as a “democratic revolution”. People are beginning to feel the need to be a part of the decisions that affect them. This involves a search for more autonomy and more individual control over their own destiny.

Opinion polls are providing evidence that a large gap is forming between government and

citizens. Citizens are becoming concerned that the institutions set up to govern them are out of sync with their values and interests. The rise of powerful non-governmental organizations and special interest groups is a sign of a public that is somehow disenfranchised from its government.

Michael Adams, president of the Environics Research Group Ltd., provides evidence from polls conducted by Environics that there has been a deep change in Canadian political culture. Deference to authority has declined while the search for personal autonomy and individualism have begun to dominate public attitudes. “Canadians” he says, “are no longer automatically deferential to institutional authority... We are more dedicated than ever to personal autonomy. We want to decide for ourselves... More and more Canadians want to decide and act as individuals or they want to act in concert with others with similar values and interests. They want to create their own networks, their own institutions and do not necessarily want to go through traditional institutions... They want to see power devolved throughout society.”⁽³⁾

The Government of Canada, in several recent strategic documents, has recognized the urgent need to modernize the relationship between government and citizens and prepare Canadians for the future; for a “knowledge-based society”.

In 1998, Jocelyne Bourgon wrote in the Fifth Annual Report to the Prime Minister of Canada on the Public Service in Canada that: “Departments and their policy teams will be called upon to help the Government of Canada explore the potential of citizen engagement in a parliamentary democracy. Citizens wish to relate to their democratic and public sector institutions in new and different ways. Citizens want to have a say in policies that will affect them most. They want to be partners in shaping Canada’s future.”⁽⁶²⁾

The Canadian government’s commitment to meaningful engagement with citizens recognizes that citizens are now demanding a real role in shaping policies and decisions that affect them. Survey information drawn from the Lortie Commission (on electoral reform and party financing) reveals that many members of the public (68 percent) agree that most of our significant national problems could be solved if decisions were brought to people at the grass roots. ⁽⁴⁾ In contrast, recent surveys conducted by Ekos Research Associates Inc. on citizen engagement indicate that while three out of four Canadians think that average citizens should have a role in shaping government policy and decisions, only one in four Canadians think they do. ⁽⁵⁾

b. Government communication challenges

Many factors contribute to the complexity of government policy-making. The increasing horizontal nature of issues is a significant challenge for governments. There are now virtually no departments or agencies where problems are self-contained or where solutions do not involve more than one traditional sector of government activity. This results in a greater need to find new and more horizontal ways of studying problems and finding solutions.

There are many challenges to governments moving towards communication approaches that involve engaging citizens in the decision-making process. Governments must remain constantly cognizant of their legal responsibilities to carry out their duties under applicable constitutions and statutes. Legal and political accountabilities are always considerations in the performance of duties. In the real world, enforcement and other regulatory responsibilities of government must be carefully balanced with joint decision-making on issues. Clarifying the concepts of sharing authority in decision-making with citizens, without sharing responsibility for those decisions, is instrumental to the success of citizen engagement.

1.1.3 Resources

A third and very important factor shaping the government environment is resource availability following years of economic structural adjustment. Governments everywhere have felt the need to streamline bureaucracies and increase efficiency in response to the forces of globalization and the need for deficit reduction. More and more traditional programs are either being turned over to the private sector or managed through alternative service delivery mechanisms. The triggering factors leading governments to look for new ways to provide public services included the scarcity of public money, the size of government deficits and a public demand for more effective and efficient service provision.⁽²⁾

Governments have been working hard to meet their goals. With a changing economy that has created a growth environment, the federal government is now moving from the overarching goal of deficit reduction to the much more complex goal of preparing Canada and Canadians for the twenty-first century and its new economy.⁽⁶⁾

Practitioners of the citizen engagement process readily acknowledge that time and resources are required to engage citizens effectively in meaningful dialogue. Not unlike any priority-setting exercise within government, managers must be convinced to re-balance their priorities. They must believe that the benefits of participative and democratic interaction with the public in risk decision-making balance the resources needed to do this effectively.

“Respecting the public service values of discretion, anonymity, impartiality and loyalty. ...While pursuing an honest dialogue, and being seen to do so, is a delicate balancing act.”

A Strong Foundation: Report of the Task Force on Public Service Values and Ethics, 1997, CCMD.⁽⁶⁵⁾

1.1.4 Credibility and confidence

The universal and pervasive crisis of confidence in public institutions is a fourth critical element in the government communications environment. In contrast with other industrialized countries, the situation in Canada may be considered to be less dramatic. Nevertheless this paper will provide evidence, using the results of opinion polls, that there may be some cause for concern.

“The evolution of responsible government from its inception 150 years ago to the system of party government we see today, seems to reflect the concurrent evolution of Canadian society from one which was predominantly rural, localist and hierarchically organized to one which is mainly urban, educated and affluent, adapting to post-industrial economic conditions.”

Canadian Study of Parliament Group, 1999 ⁽⁷⁾

Credibility, confidence and trust form the foundation of democratic government and may also be considered to be the essential elements of any successful risk communication venture. The basic tenets of the Westminster model of government, upon which Canada bases its parliamentary system, are that members of Parliament are elected by citizens and are responsible to Parliament for their actions. The concept of confidence then is linked to the concepts of trust and credibility. Confidence, trust and credibility are critical elements in the effective communication between government and the public.

Finding a balance between communication that will entail trust and credibility (transparent and open) while at the same time safeguarding the institutions of Parliament and government, is an ongoing challenge which requires a good understanding of the public's expectations as well as the mechanics of our political system.

Recent reviewers have shown that confidence in government may be on the decline and that citizens are feeling more and more disengaged from the political process. The very concept of “responsible” government as a government that is “sensitive to the opinion of the electorate” seems to be in jeopardy.

A century and a half after the inception of systems of responsible government, we are witnessing significant changes in Canadian society. Canadian society has evolved from one which was “predominantly rural, localist and hierarchically organized to one which is mainly urban, educated and affluent, adapting to post industrial economic conditions in an interdependent global economy.”⁽⁷⁾

Statistics show that membership in political parties is on the decline, with citizens feeling more

disengaged from the process and in fact opting to engage governance through largely non-partisan political mechanisms. Michael Adams, president of Environics Research Group Ltd., observes that people are more likely to become involved with organizations such as Greenpeace or the Sierra Club rather than traditional political parties because they feel their time and money promoting a cause can really make a difference.⁽⁸⁾ This phenomenon is significant in that these interest groups appear not only to be very well organized, but also very good at communicating. They seem to have the ability to form wide coalitions and are skilled at capturing media attention. Basic communications theory recognizes the power of social influence. Groups can sometimes be used as agents or instruments of change.

In addition, it has been suggested that prevalent public attitudes towards political institutions are changing. ‘Populist’ attitudes, which include anti-intellectualism and a desire to bring decision-making closer to the grass roots, seem to be on the rise. Michael Adams also notes that more and more, Canadians at the grass roots want a higher level of personal choice.

Trust, a critical factor in any successful form of communication, is a two-way street. It is difficult to achieve, fragile when won, easily lost and difficult to regain. Trust has never been strong in the relationship between the public and its political institutions. Frank Graves, President of Ekos Research Associates Inc., acknowledges that the relationship is a complex one and seems to be deteriorating due to numerous factors, some of which have already been mentioned above. Ekos’ research data reveals that “less than one in five Canadians believes that when governments make decisions, they place the highest priority on the public interest. Over 80 percent believe that the self-interests of government, big business or their friends take real priority.”⁽⁵⁾

Loss of trust in public institutions has been magnified by major incidents in Europe related to the inadequate management of risks from bovine spongiform encephalopathy or BSE (“mad- cow disease”), genetically modified organisms (GMOs) in the UK and dioxin-contaminated animal feedstuffs in Belgium.

The effectiveness of government as a source of information and a risk communicator suffers from the lack of trust in its messages and is further aggravated by the public’s increased worry about risk. Governments face the challenge of maintaining a clear distinction between communication techniques seen by the public as propaganda and those designed to provide technical information, promote, educate and change attitudes. This poses a further problem when government is both communicator and regulator. The lines between the different forms of communication seem to be blurring in the minds of the public.

Peter Sandman, a pre-eminent risk communication speaker and consultant based in the US, suggests that “People are getting in the way, demanding impossible levels of protection from essentially trivial risks, stonewalling on the lifestyle changes needed to get serious risks under control, questioning the wisdom and even the integrity of the regulators.”⁽⁹⁾

While one tends to focus on the public’s trust in government when considering acceptance of risk messages, the inverse relationship is also important. Politicians may have diminished trust in the

public, which can also be problematic.

1.1.5 Science and uncertainty

A final element of the public environment within which governments conduct risk communication is the dramatic change of public attitudes regarding science and uncertainty.

Science itself thrives on challenge and debate; the public, however, who once may have seen science as an information “authority”, no longer believes that science advice about risk is necessarily certain.

The issue of scientific certainty and its impact on decision-making about risk has emerged in both international and domestic fora as a controversial issue. Debate on the precautionary principle and its relevance, application and interpretation in environmental and human health legislation and international conventions is ongoing in governments worldwide.

While everyone agrees that scientific uncertainty is nothing new, the increasing interest in this aspect of risk assessment appears for the most part to be a reflection of the change in public attitudes towards science, risk assessment, and decision-making about risk. The public has become increasingly critical and often cynical about science and its ability to estimate risk accurately.

The fact is, public messages about science often face the challenge of innumeracy. Discussing aspects of risk assessment with the public is made difficult by a general lack of understanding of mathematical probability and the process of message framing. This is further aggravated by a general lack of understanding of exceedingly small and exceedingly large numbers. Overestimation or underestimation of risk commonly occurs as a result of differences in framing messages or in presenting numbers. Regulators and the public commonly arrive at different understandings of risk, when presented with the same numbers. This is not surprising if one accepts the theory that understanding of very low risk (small probabilities) is largely cognitive.

All of this affects the risk communicator’s job. When risks are well understood, predictable and measurable, communicating about risk can be fairly straightforward. More often than not, however, governments are being called upon to inform and reassure individuals about risks that are unknowable, unpredictable and about which the experts disagree. There are those who suggest that scientific uncertainty has a tendency to politicize risk. Situations such as these, change the nature of the engagement between experts, politicians and the public to one in which trust becomes a pivotal element.⁽¹⁰⁾

1.2 Defining the regulatory agency environment

The preceding sections of the paper define the environment in which the Canadian Food Inspection Agency (CFIA) fulfills its regulatory mandate. The following sections describe in more detail the CFIA’s functions and objectives.

1.2.1 Mandate and objectives – the tie-in to messages

The Canadian Food Inspection Agency was created in 1997 to consolidate the delivery of all federally-mandated food inspection and quarantine services as well as plant protection and animal health programs. These were previously provided by four federal government departments. Although it is a separate agency with the capacity for alternative delivery systems, the CFIA still reports to Parliament through the Minister of Agriculture and Agri-Food.⁽¹¹⁾

The CFIA's mandate includes responsibility for administering and enforcing 13 Acts and their regulations. This includes inspection services related to food safety and quality, plant protection and animal health.

The agency manages 14 programs that include all types of foods and agricultural inputs. These programs are delivered through a number of services, including product inspection, establishment inspection and registration, product certification, licencing, testing and enforcement.

Delivery of these services is achieved by nearly 4,400 people working in 18 regions across Canada. CFIA staff includes a broad range of professionals and some 1,800 highly trained front-line inspection staff.

The CFIA's strategic directions, similar to those of any federal government department, are strongly influenced by the strategic priorities of government as a whole. The Government of Canada in its Speech from the Throne in 1999 pledged its continued commitment to improving Canada's food safety system.⁽¹¹⁾

The CFIA's role in plant protection and animal health, while it is not the focus of this paper, forms a critical part of the CFIA's mandate and functions to protect Canada's animal and plant resource base against the introduction and spread of specifically regulated pests and diseases of significance to human health, the environment, and the economy.

In the area of food safety, legislative authority is divided between the CFIA and Health Canada. The table below illustrates the division of authorities and defines the integral relationship between these two federal departments in the administration and enforcement of food safety and quality, animal and plant health in Canada.

	<i>Food</i>	<i>Animal Health</i>	<i>Plant Health</i>
<i>Administration and Enforcement of relevant legislation¹ (inspection activities)</i>	<i>CFIA</i>	<i>CFIA</i>	<i>CFIA</i>
<i>Enforcement only of relevant legislation² (inspection activities)</i>	<i>CFIA</i>	<i>N/A</i>	<i>N/A</i>
<i>Establishment of Policy and standards (includes risk assessment)</i>	<i>Health Canada (for food safety and nutritional quality)</i>	<i>CFIA</i>	<i>CFIA</i>

The CFIA's food inspection program focuses on verifying that manufacturers, importers and distributors regulated by the CFIA, meet federal standards for safety, quality, quantity, composition, handling, identity, processing, packaging and labelling. In the case of exported food, manufacturers may also be required to meet other requirements of the importing country.

The CFIA's regulatory function, in accordance with Canada's constitutional division of powers, is carried out through registration and inspection of establishments for interprovincial and international movement of food, and inspection and grade monitoring of products in registered and non-registered establishments, at importers' premises, and in retail establishments. Working with Health Canada and other governments and regulated industries, the CFIA must also manage food recalls, investigations and other related enforcement actions. ⁽¹¹⁾

The description above clearly demonstrates the complexity of activities surrounding the administration and enforcement of food safety and quality in Canada. Partnerships play an integral part in the success of these activities and form a cornerstone of any risk communication strategy.

1.2.2 Risk analysis framework

The CFIA has developed its own risk analysis framework based on the Risk Analysis Model adopted by several international organizations including the Codex Alimentarius Commission, Office International des Epizooties and the International Plant Protection Convention. This model sets out three specific components which include Risk Assessment (being the determination of the degree of risk involved), Risk Management (establishing if and what measures are required to mitigate risk) and Risk Communication (ensuring that all stakeholders are involved in the process). The CFIA risk analysis framework describes the roles and responsibilities of the various participants, and establishes a mechanism to deal with situations for which risk analysis support is considered appropriate. The framework is designed to be used as part of a proactive, formal change mechanism, rather than to operate only in a reactive or emergency mode.

1

Agriculture and Agri-Food Administrative Monetary Penalties Act, Canada Agricultural Products Act, Canadian Food Inspection Agency Act, Feeds Act, Fertilizers Act, Fish Inspection Act, Health of Animals Act, Meat Inspection Act, Plant Breeders Rights Act, Plant Protection Act, and Seeds Act.

²*Consumer Packaging and Labelling Act and the Food and Drugs Act as they relate to food*

It can be adapted to situations involving major projects with several stakeholder groups, or smaller risk analysis projects involving two or more CFIA staff.

Risk analysis activities have been applied both formally and informally in developing inspection systems across all disciplines within the CFIA.⁽¹²⁾

1.2.3 Partnerships/shared responsibilities

“Under Canada’s constitution, food inspection is a shared responsibility....A seamless delivery of inspection services in the face of a patchwork of jurisdictions requires the CFIA to develop a number of arrangements with the respective provinces... Bilateral arrangements provide for more efficient and effective delivery of inspection services.”

Ronald L. Doering, President, CFIA⁽⁴⁸⁾

The sheer complexity of the food chain (both from a constitutional and a practical aspect) means that food safety is a responsibility that must be shared. The concept of sharing responsibility for safe food is not well understood by the public at large and yet it is critical to maintaining a sound food safety system “from gate to plate”.

The CFIA’s mandate does not extend from the farm to the home of each consumer, therefore in order to fulfill its leadership role in maintaining and improving the overall integrity of the food safety system, the CFIA must work in tandem with other partners including other federal departments, provincial/territorial/ municipal governments, producers, industry, distributors, retailers and ultimately each consumer of food in Canada to achieve its goal of safe food.

One notable example of such a collaboration in the area of risk communication is the Canadian Partnership for Consumer Food Safety Education, best known for its *Fight BAC!*_{TM} Campaign. This partnership is made up of a coalition of over 20 industry, consumer, health and environmental organizations and federal and provincial governments. All are committed to reducing food-borne illness in Canada by increasing the awareness of safe food handling practices through coordination and delivery of food safety education programs focused on the consumer.

In support of the Partnership’s commitment to reduce food-borne illness, it recently launched a new education package designed for children from Kindergarten to Grade 3, and their parents.⁽¹¹⁾

1.2.4 Public perceptions and expectations

The CFIA, in developing plans for the future, must fully take into account the perceptions and expectations of Canadians. Canadian consumers are asking for more and better information about food safety and nutritional issues. Increased media attention on food safety issues, both in Canada and abroad, has influenced Canadians' perceptions and will continue to do so. Canadian attitudes towards responsibility of government for food safety have evolved. A 1997 survey by Environics Research Group Ltd. conducted for the CFIA revealed that Canadians feel food safety is not the sole responsibility of government but rather that consumers have a role to play by preventing bacterial food-borne illness in the home and that industry also has a responsibility in ensuring that food is safe.⁽¹³⁾ The CFIA recognizes that Canadians expect more accountability and openness in government generally, as well as effective and efficient government service delivery. The agency also recognizes that Canadians expect the federal government's science programs to be world-class, and that policies and interventions must be informed and based on "good" science.

2.0 THEORETICAL ASPECTS OF RISK COMMUNICATION

2.1 Communication theory

The following section contains a brief theoretical overview of some of the different aspects of public policy and communications and, in particular, risk communication. First we will explore the evolution of public opinion and the role of mass communications. Next we will look more closely at risk communication and its components.

2.1.1 Public Judgement

Public attitudes about risk are an important aspect of risk management. Considerable resources are directed by risk management agencies to analysing public opinions towards risk. Experience has shown that these attitudes are far from static, rather, they seem to take on a life of their own and evolve over time. Daniel Yankelovich, author of *"Coming to Public Judgement: Making Democracy Work in a Complex World"*; suggests that this evolution is quite an orderly process and that public attitudes start with "raw opinion" and move toward public judgement in a complicated process that involves sorting through and coming to terms with conflicting emotions, values and interests around a given issue. He further states that while reaching public judgement does imply a deeper resolution to an issue, it may reasonably be expected to fall somewhere between the ultimate goal of "wisdom" and the more common notion of a "well-informed citizenry."⁽¹⁹⁾

Yankelovich in fact defines seven distinct stages in what he calls "the journey from raw opinion to public judgement."

- 1.01 Awareness
2. A sense of urgency or demand for action
3. A search for solutions

4. Reaction and resistance
5. Wrestling with alternative choices
6. Intellectual assent or resolution at the cognitive level, and
7. Full resolution—moral, emotional and intellectual

This concept provides critical insight into the design and development of risk communication initiatives. Each of these evolutionary stages poses a different challenge to the risk communicator, and requires a re-evaluation of goals, messages and methods used for communicating risk.

2.1.2 Public communication – the role of the media

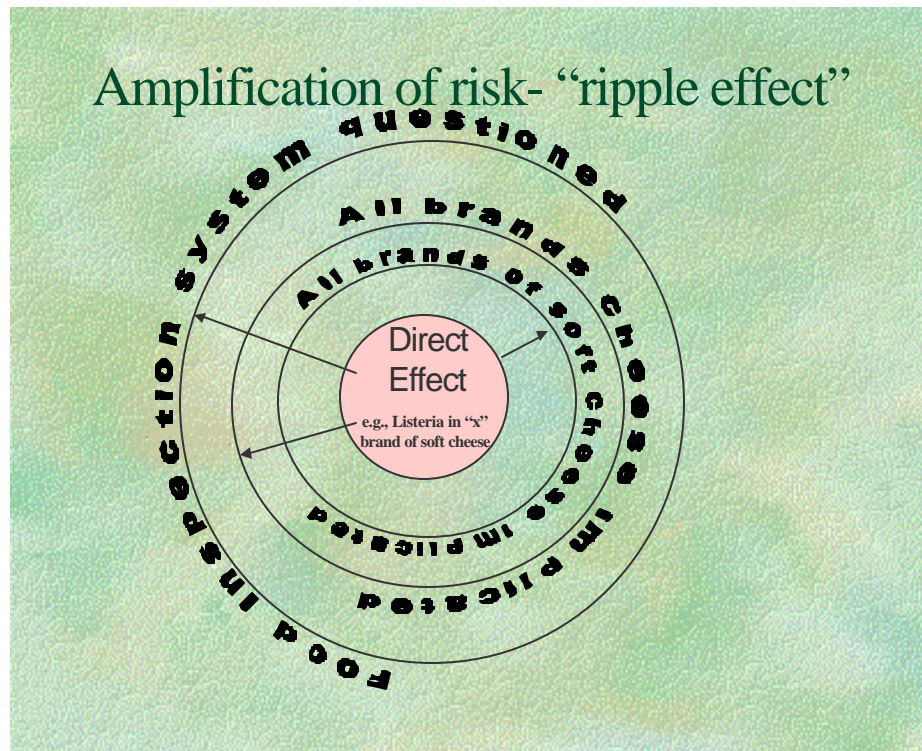
“Outbreaks such as Jack in the Box increased overall North American media coverage of microbial food safety”
D. Powell, 1998 ⁽¹⁷⁾

The media play an important role in risk communication and the formation of public views on an issue. Daniel Yankelovich views the media as an information source that actually helps the public form an opinion on risk. Despite its importance, however, the extent of the media’s impact on public perception and management of risk remains somewhat of a mystery and is the subject of much ongoing research. It is widely accepted that the media are not only an important source of risk information to the public, but also have a role to play in bringing issues to the attention of the public, which as a result helps create a sense of urgency around them.

Peter Bennett of the UK Department of Health suggests that while media coverage may in fact amplify the public’s interest in an issue, it does not create it. Bennett goes on to say that “a good story is one in which public and media interests reinforce each other.” ⁽¹⁴⁾

Journalists are not educators, or at least, this is not their primary role. From this perspective, it is not surprising that media coverage seldom results in more than cursory coverage of an issue, contributing little if anything to the more complicated process of working through the problems. According to Yankelovich, news coverage that presents positions as adversarial often actually retards progress towards dealing meaningfully with issues. The adversarial position rarely corresponds to the real views of most people.

Drama seems to be the mainstay of media coverage. This is a style of communication which rarely comes close to true risk communication. The media tend to highlight existing concerns, uncertainties and conflicts, rarely question the legitimacy of any source, and present all sources on a rather equal footing. In this sense, the media’s role might be considered to be “non-judgemental”. Information is provided to the public with little or no analysis of its technical accuracy. ⁽¹⁵⁾



Media coverage is sometimes difficult to predict and explain. The term “snowball effect” has been used to describe a story that has become established and where increased frequency of coverage results in media competition for interest.

The “ripple effect”, illustrated graphically above, is a form of risk amplification and it often occurs when stories with an original focus on a single specific risk are expanded to include related issues.

The example provided above illustrates how the finding of a human pathogen, in this case *listeria monocytogenes* in a certain brand of soft cheese, could be “amplified” by media coverage to create concern about all soft cheeses. This might in turn create concern about other types of cheese which might (should coverage continue) lead to further concern about food inspection in general.

Often these effects which originate from routine media coverage can lead to what is termed by some as a “media event”.

It has been suggested that media coverage is driven by rarity, novelty, commercial viability and, unfortunately, very little by risk evaluation.

Bennett has developed a list of “indicators” which may help us to better understand why and when an issue is likely to become a media event. Of the triggers listed, there is some evidence, according to Bennett, that the single most important trigger is blame (i.e., identifying the party, whether government or other, upon which to place blame). Several researchers have theories on why some stories suddenly erupt or take off without warning. Roger Kasperson, a well-known researcher in social amplification theory, further suggests that several factors need to be present in combination before an issue “takes off” in the media. ⁽¹⁶⁾

Heavy media coverage of risks can have a measurable effect by introducing what is commonly referred to as “availability bias” to risk perception. This type of bias results when events can be easily recalled by the public. These events are then perceived to be more frequent and this in turn leads to an overestimation of the frequency of the event. For example, survey data show that the public perception in the US from 1996–1997 of the perceived threat to food safety from spoilage, E. coli and quality control increased by 20 percent. It is suggested that this is due largely to increased media coverage of the risk of food-borne illness.⁽¹⁷⁾

The ethics of journalism becomes an issue when the media emphasizes one risk over another.⁽¹⁸⁾ “Misery reporting or dread news” as described by Peter Lutz of the Centre for Risk Research in Stockholm, generally attracts audience interest and enhances the marketability of news. It has been suggested that it is a combination of media corporate business practices and a particular version of journalistic ethics that fits well with this style of media coverage.

Media Triggers

A possible risk to public health is more likely to become a major story if the following are prominent or can readily be made to become so:

1. Questions of blame
2. Alleged secrets and attempted cover-ups
3. Human interest through identifiable heroes, villains, dupes etc. (as well as victims)
4. Links with existing high-profile issues or personalities
5. Conflict.
6. Signal value: the story as a portent of further ills.
7. Many people exposed to the risk even at low levels
8. Strong visual impact (eg., pictures of suffering)
9. Links to sex and/or crime.

Bennett (1999)⁽¹⁴⁾

In contrast, when journalists, especially reporters for major news organizations, see it as their job instead to explore conflicting values surrounding an issue, then the mass media do become a useful forum for generating the actual process of public deliberation.

To move the process along, Daniel Yankelovich suggests the development of “a mass communications strategy that helps the public understand the real complexities of the phenomenon, confront the conflicting values or interests that come into play in the search for solutions, and define a common ground which can become the basis for effective action.”⁽¹⁹⁾

2.1.3 Communication models

Several generic models for communication have been described in the literature.

Peter Bennett ⁽²⁰⁾, observes that there has been a noticeable shift in the literature on risk. Traditional views emphasize how the public misperceives risk and treats expert estimates as incontrovertible; any deviation from them may be seen as stupid or ignorant. These views have evolved into more modern approaches that stress the importance of factoring in public reaction to risk, and lead to an understanding of the need for a real two-way interaction between experts and lay people in order to achieve a common view on risk.

In the clash between the traditional or “technical view”, also known as the “Factual Information Model”, and the “democratic view” of risk communication elaborated by Cvetkovich et al. in 1989⁽⁶⁴⁾ and, Rowan in 1994⁽⁶³⁾, it is becoming clear that the democratic view is taking hold as the most effective method of risk communication. The democratic view, in its most idealistic form, proposes a two-way exchange of information, with rules to guarantee a just and fair process, participation of all parties in decision-making, and no persuasion. The democratic view has as its objective “mutual understanding”, not “exertion of power”. While this view sets the stage for modern risk communication, there is more evolution to come.

In short, the traditional premise that “expert” decisions about food safety would be accepted without question by a grateful public is no longer valid. Engaging citizens is not merely a fashionable concept for public policy-makers: participatory democratic values have emerged and shaped the way risk communication is done. In the UK, the events surrounding the recent food crises associated with BSE and GMOs have provided ample experience with success and failure of traditional risk communication models.

The experience of the Advisory Committee on Novel Foods and Processes (ACNFP) in its review of products produced through genetic manipulation techniques, has led to significant changes not only in its advisory committee structure but also in the way that food-related issues are handled. Recognizing the need to better understand public views, values and perceptions, a consumer representative and ethical advisor were added to the advisory committee. The committee learned that:

- “When decisions involve the public being exposed to any risk, not of its own choosing, they must be taken as openly as possible.
- Consumer concerns, even if they do not appear to have a rational basis to scientists, must be taken seriously
- Approaches which attempt to sort out the science first, then look at the consumer issues, simply do not work.”⁽²¹⁾

2.1.4 Multidimensional communications

The multidimensional nature of risk in a pluralistic society only increases the challenges to communicators and risk communicators specifically. Studies have shown that different cultural groups within society will view risk in completely different ways. Despite these findings, Thompson ⁽²²⁾ suggests there is a common thread with respect to what the public would like regulatory agencies to do:

- Address moral commitments and value judgements explicitly.
- Give people some control over their exposure to risk.
- Address the distribution of risk and benefit, including the distribution over time (generations).
- Be accountable.
- Acknowledge that suppressing risk in one place may merely transfer it to another.
- Show that this has been accounted for in the policy analysis.⁽²²⁾

From the perspective of government, the political dimension of risk is an important one. Sobey et al., (1994) describe the close link between the social and political dimensions of risk. These researchers suggest that “one’s world views or cultural bias significantly influence one’s political orientation.” In this sense, context is an important consideration when managing risk. Public sector risk managers will necessarily be influenced by the political context within which they operate. This context will reflect a somewhat broader scope of impact associated with a risk or hazard than that of the individual citizen whose perspectives tend to be regional or local.⁽²³⁾

One of the many challenges of risk communication is then to convey to all parties associated with decision-making, the political aspects of risk and to clearly identify the values associated with the political dimension and the logic behind the choices.⁽²⁵⁾

Economic dimensions of risk play an important role in effective use of resources as well as in policy development. An example of this may be seen in the work of Latouche et al.⁽²⁵⁾ In 1998, these researchers completed a study on the willingness of French consumers to pay for beef which should not transmit Creutzfeldt-Jakob Disease (CJD), knowing that zero risk does not exist. The study concluded that understanding consumers is the key to restoring public confidence. In this instance, consumers showed a willingness to pay more for safe products, but at the same time they expressed a desire to be able to choose the least risky products themselves (in this case, through labelling that gave information on the product’s country of origin). From a policy perspective, this research reveals the need for balance between political decisions based on ethical practice and the desires of individual societal groups. There is a need to offer choices while simultaneously avoiding discrimination against certain sectors of society.

2.2 Risk communication

In order to better understand the field of risk communication, it is important to realize its evolution from the field of “risk analysis”, rather than the field of “communications” per se. As a result of its origins, risk communication has a limited basis in the tenets of communications theory. This important area of communications is subject to a more limited focus in its support of risk management activities.

Baruch Fischhoff, a leading psychologist and researcher in the field of decision-making, summarizes the evolution of risk communication over the last 20 years by suggesting an eight-stage chronology of its development. Each stage is “characterized by a focal communications strategy that practitioners hoped would be effective, and by the lessons learned about how far the strategy can go. Note that each stage builds on its predecessor; it does not, however, replace them.”⁽²⁶⁾

Developmental stages in risk communication

- All we have to do is get the numbers right
- All we have to do is tell them the numbers
- All we have to do is explain what we mean by the numbers
- All we have to do is show them that they've accepted similar risks in the past
- All we have to do is show them that it's a good deal for them
- All we have to do is treat them nice
- All we have to do is make them partners
- All of the above

Baruch Fischhoff ⁽²⁶⁾

As we can see from this wry depiction of the history of risk communication, facts and perceptions, both empirical and non-empirical data help form public judgement on risk issues. As Fischhoff has suggested, "In an ideal world, risk management should be guided by facts alone. Facts concerning not only the sizes of the risk and benefits involved, but also the changes in political and social status that arise from the risk management process." ⁽²⁶⁾

The University of Kentucky's Agripedia describes what risk communication is by providing a definition that describes the key elements of this area of communication in its more modern state of evolution:

"Risk communication is an interactive process of exchange of information and opinion among individuals and groups, and institutions. It involves multiple messages about the nature of risk and other messages (not strictly about risk) that express concerns, opinions, or reactions to risk messages or to legal and institutional arrangements for the management of risk." ⁽²⁷⁾

The question that remains is, why has a separate field of study dedicated to the communication of risk evolved? This brings us to the essential purpose of risk communication which has been summarized by Dr. Ortwin Renn, a researcher at the Centre for Technology Assessment in Baden, Germany. Dr. Renn describes the three main elements of risk communication as: informing (changing knowledge), persuading (changing attitude/behaviour) and consulting. Dr. Renn suggests that risk communication exists:

"To make sure that all receivers of the message are able and capable of understanding the meaning of the messages they receive;

To persuade receivers of a message to change their attitudes or their behaviour with respect to a specific cause or class of risks;

To provide the conditions for a dialogue on risk issues so that all affected parties can take part in an effective, competent and democratic conflict resolution process." ⁽²⁸⁾

The CFIA's risk analysis framework has adopted the risk communication definition found in the Codex Alimentarius Commission (CAC) Risk Analysis framework. The CAC describes risk communication as

“ the interactive exchange of information and opinions concerning risk among risk assessors, risk managers and other interested parties.” (With one objective being the achievement of better understanding of risk and risk related issues and decisions).

Most practitioners of risk communication will agree that, even when effectively applied, risk communication will not solve all problems, nor will it avoid conflict on issues. The inverse of this is also quite true, however. Poor or absent risk communication will undoubtedly lead to a failure to manage risk effectively.

Participative approaches to risk communication may lead to better consensus, but cannot guarantee absolute harmony. From the perspective of government, responsive risk communication respects both the public (by being participative) and its right to know (by being as transparent as possible), while also appreciating the limitations of responsible government.

Three essential components of risk communication include trust, perception and the important factors that mould public perception which may be described as “dread values”.

2.2.1 Trust

Of the three components of risk communication discussed in the following sections, trust is the most important factor in determining the effectiveness of risk communication messages.

Trust is characterized by a number of features including: perceived competence, objectivity, fairness, consistency and goodwill.

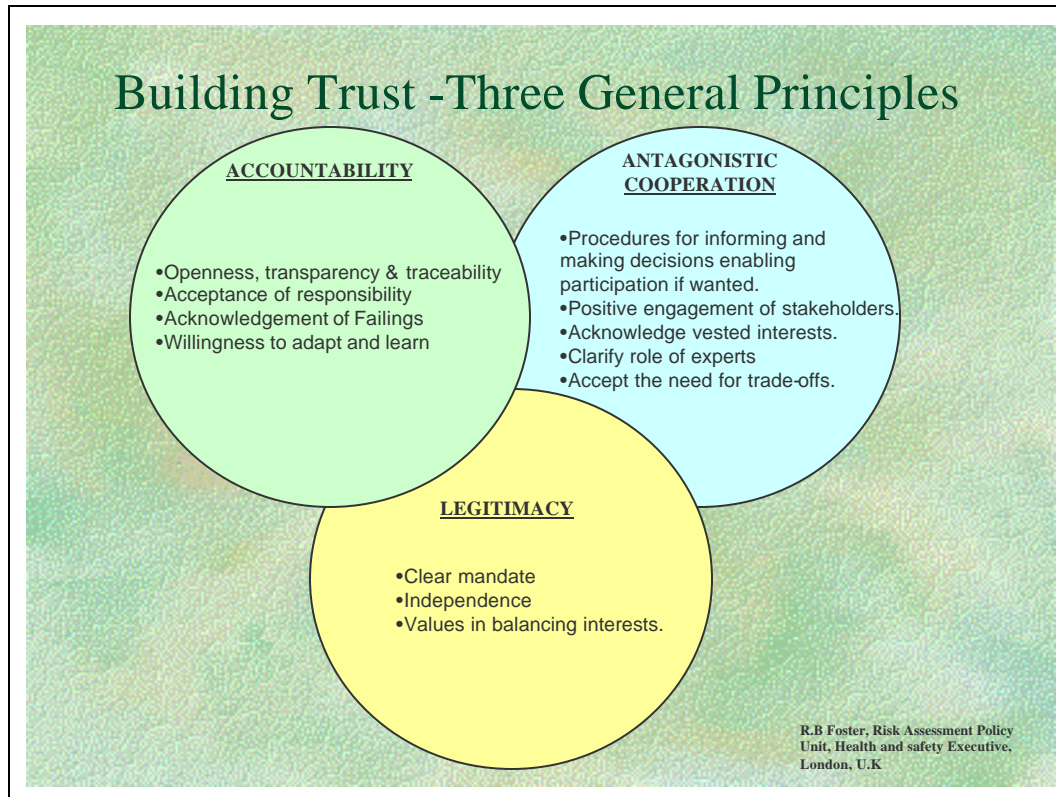
Risk information sources, such as government, need to understand that trust is a very important factor in the acceptance and effectiveness of risk-based messages to the public.

Most research confirms that government is in fact considered by the public to be a less than trusted source of risk information. The public tends to view government risk-based information as distorted, biased and probably incorrect. The memory of wrong government decisions about risk tends to linger in the public consciousness, adding fuel to the skepticism.

Despite this generally accepted view, a dichotomy emerges in the public psyche revealing that in fact, the public wants and needs to trust in its decision-makers and regulators. In today's society, people and organizations have few options but to trust the systems in place to address hazards, simply because many hazards cannot be dealt with by the individual. Establishing a trusting relationship with its audience and, more important, continuing to maintain it, is becoming one of the major tasks of government communicators. In the UK, where a recent food safety crisis has forever changed the public's trust in government messages, regaining trust is becoming an important goal. R.B. Foster of the UK Government Health and Safety Executive describes the process for building trust as one of establishing legitimacy; stakeholder engagement in a form

described as “antagonistic cooperation”; and promoting greater accountability.⁽²⁹⁾

These essential factors and their components as described by Foster are depicted graphically below.



The success of risk messages has been shown to be linked closely to the “trust” or credibility of the message source (risk communicator) to the message recipient.

Studies have shown that medical sources are seen as being more expert and knowledgeable about risk and have greater freedom to present information to the public. Medical sources are also seen to have greater concern for public welfare, greater responsibility and a better track record for providing information.

Lynn J. Frewer, Head of Risk Perception and Communication, Institute of Food Research, UK, describes the importance of a trusted source in messages related to two common categories of hazard: lifestyle hazards and emerging technologies. Research has shown that lifestyle hazards (such as those associated with food handling practices) are more likely to be accepted when information is provided by a highly trusted source such as the medical profession. Messages about technological hazards (such as those associated with biotechnology) face different challenges. In the case of a technological hazard, persuasive messages from a less trusted source have in fact been shown to have a negative effect on the recipients’ acceptance of the message.⁽³⁰⁾

A recent public opinion poll in Canada, measuring public trust in different professional groups,

found that Canadians ranked nurses, pharmacists and physicians first, second and third. Elected officials and civil servants ranked well below in the index.⁽³¹⁾

In another study on public health management, Ian Langford et al., in a recent paper on public reactions to risk and the role of trust,⁽³²⁾ cite a case study which demonstrates that people will distance themselves from the process when regulators are perceived as untrustworthy or uncaring. Health messages about lifestyle hazards face significant challenges resulting from a combination of public apathy and heuristic bias. Peter Sandman has managed to capture the essence of this phenomenon in his statement that “fatalism makes apathy rational”.⁽⁴⁶⁾ Reality dictates, however, that sometimes people will find good reasons for taking risks if only for the perceived social benefits.⁽³²⁾

Tony Taig, an active practitioner in risk management and communications in the UK, describes one of the major challenges of risk communication as the “intangibility of the benefit”. People are often asked to trust the information source whether it be government or the private sector, when it comes to the benefit of a risk management measure, a benefit that is often intangible.⁽³³⁾

Building trust has become the pivotal focus of risk communication. Thus, maintaining trust must be a priority in the design of any risk communication strategy. Governments face several challenges in the area of trust and credibility, not only because they are already perceived to be a less trusted source, but also because they sometimes discourage including the public in the decision-making process.

Anna Coote and Jane Franklin, looking at models for public participation in health risk negotiation in the UK, present a fairly cynical view of politicians’ perceptions of the public.⁽¹⁰⁾

“How politicians view the public:

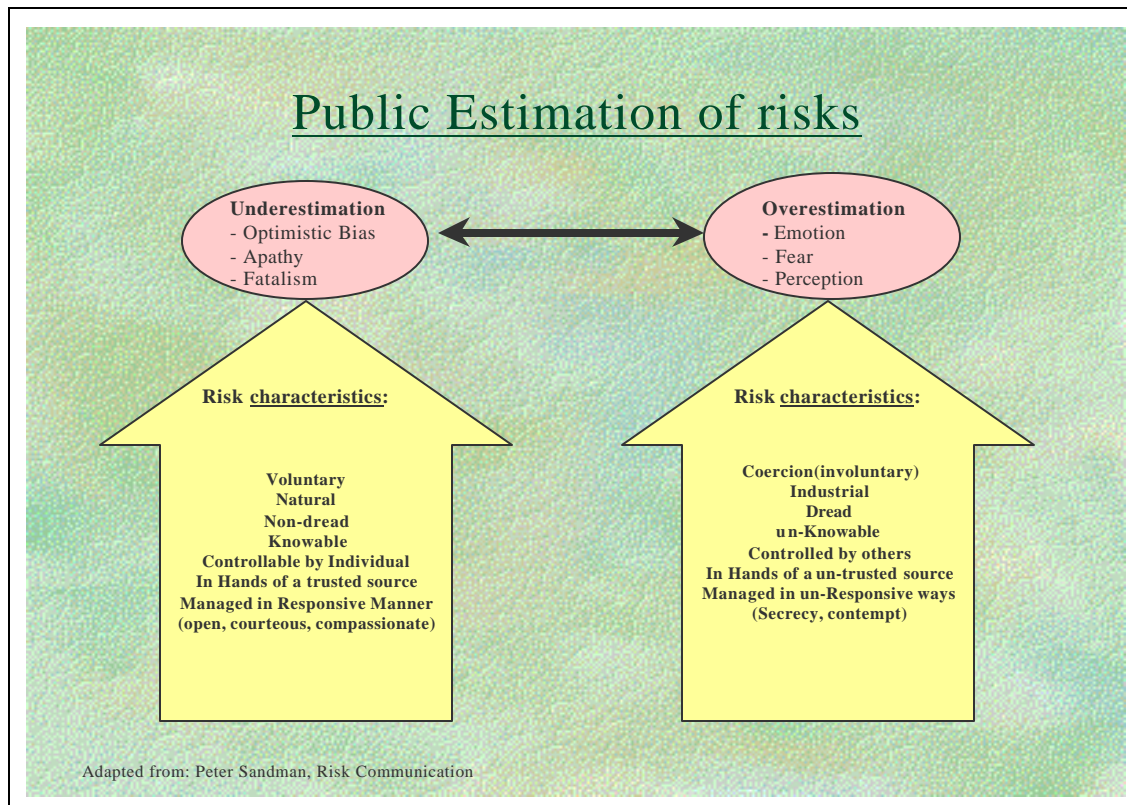
- Incapable of grasping complex issues
- Incapable of forming relevant views
- Believe anything they read in newspapers
- Opinions are shaped by narrow selfish concerns
- Apathetic
- Will not take the time or trouble to consider anything that does not affect them directly

In short gullible, selfish and irresponsible”

A. Coote, J. Franklin ⁽¹⁰⁾

Fortunately, the Canadian experience with various mechanisms of citizen engagement has revealed that these assumptions are not valid. Engaging citizens in risk management decision-making can in fact help to generate trust on both sides. Nevertheless, in order for trust to be maintained, the public must perceive that its input is taken seriously enough to have an impact on the development of policy.

2.2.2 Perception



Perception is also an important consideration when communicating about risk. Fortunately the subject of risk perception has been the focus of considerable research over the past 20 years. This research has provided risk communicators with some excellent insights into the science of risk perception and the psychological dimensions of risk. Research and experience both show that experts and the public seldom agree on risk, yet as Paul Slovic observed in 1987, experts are prone to the same biases as the general public, particularly when they are forced to go beyond the limits of available data and rely on intuition.⁽³⁸⁾

Public attitudes towards risk are known to be influenced by a number of biases that result in personal risk perceptions which are often not substantiated by objective probabilistic models. “Optimistic bias” and “outrage bias” (better safe than sorry) are two examples of why individuals may hold seemingly irrational views about certain risks.

Optimistic bias, also known as “unreal optimism”, is one of the many perceptual challenges facing risk communicators. Some researchers will claim that it is in fact one of the most important problems faced by those communicating about risk. Studies have shown that individuals may acknowledge the existence of a risk, but will often assume that they personally are not vulnerable to it and are more knowledgeable about hazards relative to others (negative health effects of cigarette smoking are an example of this). It is the classic “it couldn’t happen to me” syndrome. The more an individual feels he or she knows about the hazard, the more control that person feels he or she has over exposure. Optimistic bias has also been found to be common for positive

events, while pessimistic biases are rare.⁽³⁹⁾

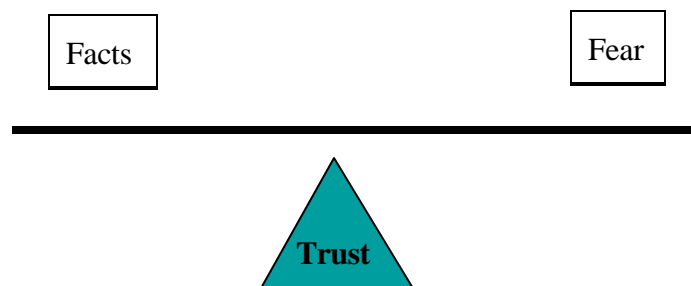
This phenomenon is extremely difficult to overcome and can cause risk messages to fail. Risk communication initiatives must be designed to ensure that the messages target individual groups within the population. To do this one must first find ways of segregating individual differences and needs and include the real concerns of the public in information provided.⁽⁴⁰⁾

a. Dread Values

*“The risks that kill you are not necessarily the risks that anger and frighten you.
To bridge the gap between the two, risk managers in government and industry have started turning towards risk communication.”*

Peter M. Sandman⁽³⁴⁾

Fear is one of the basic human emotions. It is grounded in the biological necessity for protection from danger and as such, it has a powerful impact on the perception of risk. David Ropeik, former journalist and lecturer at the Harvard School of Public Health, describes the subtle balance in risk communication between emotions (fear), facts and trust, as a see-saw in which trust is the fulcrum and facts and fear balance against each other at opposing ends.⁽³⁵⁾



Much work has been done on the psychology of an individual's responses to a range of hazards. Characteristics described as “fright”, “outrage”, or “dread” factors have been identified by researchers such as Slovic (1986), as being important in shaping perceptions about certain hazards.⁽³⁶⁾

Fright /Dread Factors:

The following perceptions may make a risk seem less acceptable ie., more worrying:

- risk is involuntary
- risk seen as inequitable
- risk seen as inescapable
- source of risk unfamiliar or novel
- risk man-made rather than natural
- hidden and irreversible damage
- danger to small children or future generations
- form of harm arouses much dread
- victims identifiable not anonymous
- risk appears to be poorly understood by science
- contradictory statements from responsible sources.

Peter Bennett, David Coles, Anne McDonald, 1999 ⁽³⁷⁾

Peter Bennett et al., of the UK Department of Health, describe a practical application of these factors in a risk communication strategy. Scoring issues using a list of identified “fright factors” should help to alert a risk communicator to a possible high-profile scare.⁽³⁷⁾

The risk associated with BSE is a classic example of “dread” risk. Taking into account the fright factors listed in the table above, one can easily see how public perception of BSE risk led to this becoming a high-profile issue for both government and the media:

- certainty that the disease is fatal and involves a particularly unpleasant death.
- perceived to be little understood by the scientific community (conflicting messages convey scientific uncertainty and disagreement)
- unfamiliar disease (few people have direct experience with it)
- the risk is involuntary (initially at least, it was seen as out of individual control)
- recently focus on the possibility of large scale exposure, with long-term potential to affect thousands of individuals.

3.0 ASPECTS OF SCIENCE-BASED COMMUNICATION

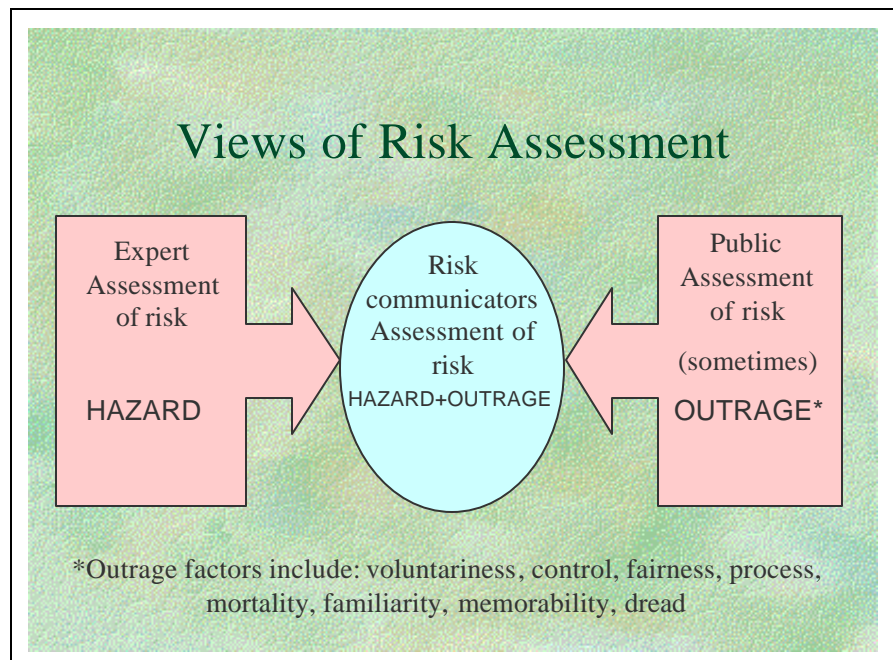
3.1 Communicating about science

Communicating about science has always posed a particular challenge to risk communicators. This is partly due to a reluctance of policy makers and scientists to present the public with complex technical scientific information, which risk managers are sure will be misunderstood or misinterpreted. There is also a reluctance to present the public with findings where there is scientific uncertainty and expert disagreement.

Tony Taig, a key UK consultant in risk management and communication, who led and managed a 1997/98 benchmarking study of risk communication on behalf of a number of UK government departments, found governments lacking in their ability to tailor messages to the audience and purpose. With respect to science, criticism was centred in the fact that “the dominance of science in risk policy tends to lead to statements which are objective by nature, devoid of empathy or emotional content, with a consistent focus on risk reduction rather than on trust and confidence, and to very weak articulation of benefits of proposed risk controls in terms meaningful to audiences”.⁽³³⁾

3.2 Duality in risk assessment

Only recently has the concept of the duality of risk assessment been recognized. The existence and validity of both expert (empirical) assessment and public (non-empirical) assessment of risk, are integral parts of an effective risk management model.



This “evolution of insight” has led to a move from an emphasis on public “mis-perceptions” and an attitude that all deviations from expert estimates are products of ignorance or stupidity, to new approaches which stress that public reactions to risk often have their own rationality, and that “expert” and “lay” persons perspectives should inform each other as part of a two-way process.⁽²⁰⁾

Perceptions on evaluation of risk

Experts:

- Rely on risk assessment
- Objective
- Analytic
- Wise
- Rational
- Based on real risk

Public:

- Rely on perceptions of risk
- Subjective
- Hypothetical
- Emotional
- Foolish
- Irrational

Slovic (1999) ⁽⁴¹⁾

In Canada, the importance of public and expert assessment of risk has been recognized in a recent report of the Assistant Deputy Minister Working Group on Risk Management. This report describes a model of risk management in public policy that reflects a horizontal consensus among federal departments.

This model³ explicitly recognizes that the assessment stage of decision-making is composed of two contexts: empirical and public. They are separate processes; however, neither context works alone.

In a public risk management framework, input from both the empirical and public contexts of assessment ensures a more complete range of information available, thereby leading to the development of relevant and effective policy options.⁽²⁴⁾ It is recognized that either context can trigger attention to an issue.

Lack of public understanding of science is complicated by the fact that people tend to avoid learning about subjects they fear. Studies have shown that an increased public understanding of science alone is unlikely to influence acceptance of a particular technology that is perceived as potentially risky.⁽³⁰⁾ Traditional risk communication strategies, which focus solely on public education, are bound to fail. Experience has shown that presenting the public with educational material does not necessarily lead to better public acceptance. On the contrary, it has been shown that people tend to select information which is consistent with already held views and values.

³ See Model of Public Risk Management Decision-making, Section 6.1.4

3.3 Uncertainty in science

Certainty in science and scientific decision-making has become the subject of much debate. The emergence of the precautionary principle points to an increased recognition of the necessity of making decisions and developing public policy under conditions of scientific uncertainty.

The increased profile of “uncertainty” in science from a public point of view, may well be a symptom of a post-industrial society, combined with citizens’ past experience with science-based decisions. It is recognized that in the new millennium, scientific risk assessment is under attack. The public has learned from experience that science can be wrong. Sometimes science fails to provide the right answers. Scientists appear to be losing stature in the public perception, and public fears of scientists “playing God” can be seen in the ethical dilemmas around new technologies such as biotechnology.⁽²⁹⁾ Sheila McKechnie and Sue Davies of the UK Consumers’ Association observed that many modern developments and innovations have proven to be a two-edged sword and that the public has tired of false reassurances of safety and of decisions presented as though they are relatively conclusive when fundamental uncertainties still remain.⁽⁴²⁾

Frewer states that the public is quite capable of understanding the concept of uncertainty and thus should be provided with clear information about the uncertainties around risk. This in turn will increase perceptions of trust in information sources and better acceptance of emerging technologies.⁽³⁰⁾

Decision-making in situations of scientific uncertainty is characterized by lack of certainty over facts, dispute over values, high stakes and urgency. Langford, Marris and O’Reardon aptly describe decision-making under scientific uncertainty as “the need to make hard decisions based on soft facts.”⁽³²⁾

In cases where science remains uncertain, the role of policy makers becomes extremely complex and challenging in developing workable and socially tolerated solutions.

The evolution of risk communication from predominantly one-way communication to two-way sharing of information becomes critical in cases where scientific uncertainty is a predominant feature of a risk. Including both expert and lay perspectives in the decision-making process becomes the cornerstone of effective policy-making. Coote and Franklin suggest that interaction with the public aimed at decision-making in cases of scientific uncertainty shifts from communication to negotiation. Where “communication” implies a two-way conversation for sharing information and perspectives, and “negotiation” may be seen as something much more interactive, along the lines of what Dr. Ortwin Renn describes as “rational discourse”³, or a multiple engagement of diverse forms of knowledge and experience. Negotiation broadens the scope of interaction forcing participants to deal openly with ambiguities and uncertainties, and accepting that both expert and lay knowledge

³“In the theory of communicative action, the term discourse denotes a special form of dialogue in which all affected parties have equal rights and duties to present claims and test their validity in a context free of social or political domination. Within the context of risk communication, discourse provides a platform to resolve conflict or engage in joint problem solving by a specific set of rules.”⁽⁵²⁾

of a particular risk may be insufficient or irrelevant.⁽¹⁰⁾

Experience has shown that risk communication which continues to provide false reassurances of safety can only prove counter-productive in the longer term.⁽⁴²⁾

4.0 COMMUNICATING ABOUT FOOD

Having completed a brief review of some important notions in risk communication theory, we will focus on risk communication in the specific area of food and food risk. The following sections will attempt to outline some of the unique issues associated with risk communication about food related risks.

4.1 Intrinsic components of food

The value and importance of food to everyone is undisputable. We eat to live, but food is more: it is both a commodity and a luxury that we share with our friends, families, acquaintances and business partners. Food forms an integral part of our political and cultural identity.

Our relationship with food has changed with the evolution of Canadian society to one that was predominantly rural and localist to one that is mainly urban, educated and affluent. In today's society, few people know how food is grown, harvested and processed. We long ago lost touch with the food chain and now feel that we have lost control over the food we eat. No longer do we walk into our own gardens, harvest, cook and preserve our own food.

The evolution of the food industry has corresponded with the evolution of Canadian society. Competition has become a key issue for the food industry and agriculture. Focused on growth, profits and efficiency (yield), food producers try to reduce their costs through new production patterns, new chemical processes and additives or animal drugs and stimulants. In many cases, food processors rely on least cost combination of factors, which result in substituting cheaper industrial by-products for more natural inputs. ⁽²⁵⁾

This situation has contributed to the public's sense of a lack of connection with its food supply and the increasing impression that food is becoming another source of risk.

Globalization has contributed to the public's disquiet about the food supply. Free movement of people, goods and services has increased the numbers of hazards and opportunities for hazards to be introduced into the food chain. Often these hazards are exotic in nature (*Cyclospora* on raspberries from Guatemala linked to cyclosporiasis outbreaks in Ontario, Canada, May 1998) and appear without warning.

The importance of food in our lives explains in part why communications issues related to the food supply have recently moved to the forefront of most government and private sector agendas. Few things concern the public more than a known or perceived breakdown in the food safety chain.

Shiela McKechnie and Sue Davies provide some perspective on the divergent values that have created a gap between food producers, processors and the public. As the complexity of food production increases, consumers seem to feel the need to return to more "natural" food. Industry, however, sees new technologies such as genetic modification as a means of producing safer, higher quality and more nutritious food. The public can see few direct benefits for themselves from new

food technologies, yet they feel that ultimately they are the ones being asked to take the risks. Debates on food safety, therefore, are likely to be characterized by some of the most extreme and fundamental rejections of the view of science as progress.⁽⁴²⁾

4.2 Public perception of food risk

Public information about food and its impact on health can be overwhelming. Messages from the media, government, private interest groups and medical professionals ask the public to balance the many health-related aspects of food (ranging from excess fat leading to heart disease, cancer and diabetes, to bacterial contamination leading to food-borne illness). The end result is that people are worrying more about what they eat.⁽⁴³⁾

Opinion polls and research studies on public perception of food safety issues abound. Chris Fife-Shaw and Gene Rowe, in their study on public perception of food safety, suggest that public perception of food hazards follow a specific life cycle, based on the perceived familiarity of the hazard and perceptions of the hazard in terms of severity and awareness. If this is true, the practical importance of risk communication in changing unknown hazards into known hazards is significant.⁽⁴⁴⁾

The public tends to assess risk based on specific context. In general terms, risk associated with food is not well tolerated, particularly when no specific benefit is associated with the risk.

In fact, some researchers have questioned whether studies on public perception of risk in general can be applied across other more specific domains such as food risk. Fife-Shaw and Rowe suggest that food hazards may be perceived differently than other hazards for a number of reasons:

- “1. We are dependant on food in ways that we are not dependant on other risk makers, i.e., nuclear power. Food choices tend to be personal or left to trusted relatives.
2. Many food choices are habitual and decisions about the selection of particular products may have been made at some considerable time in the past. We do not know whether perceptions cause, or are caused by, these choices.
3. Most hazards associated with foods, when present, tend not to be visible and many people will have eaten mildly hazardous meals at some point in their lives without noticing negative consequences. Eating is not generally perceived as especially hazardous, except in times of food scares.”⁽⁴⁴⁾

In 1997, Lynn Frewer et al. concluded a study examining two consumption-related hazards in order to establish the effects of source credibility, persuasive content and personal risk relevance on risk perception and source credibility. The study provided some interesting information on the public perception of microbiological risk. In general, microbiological risk was associated with increased thought about preventative actions and was also associated with an increased perception that the hazard was out of the control of the individual. This seems to be attributed to contracting food-borne illness outside of the

home (restaurants, etc.). Food-borne illness was also associated with the need for more information.⁽⁴⁵⁾

4.3 Food risk versus ethics

New technologies often invoke concerns among the public that centre more on issues of ethics than on issues of risk. Public resistance to genetically modified (GM) foods is a typical example of a public expressing among other concerns, its concerns over ethics. The subject of food, simply because of its nature, may well be unique with respect to the public's ethical concerns associated with tampering. When this is the case, regulators and risk communicators will never meet the public's concerns just by dealing with risk.⁽²¹⁾

4.4 Public apathy

While the public's perception of risk in the food supply may be very specific, and related to media coverage as already discussed, in general, the public is apathetic about risk. This is a serious matter for risk regulators and risk communicators.

Peter Sandman suggests that "the most serious health hazards in our lives (smoking, excessive fat in the diet, insufficient exercise, driving without a seatbelt, etc.) are typically characterized by under-response — that is, by apathy rather than panic".⁽⁴⁶⁾ To some extent, theorists would attribute this behaviour to optimistic bias, but it would seem that there are other underlying factors as well.

Consumer Association focus groups conducted shortly after the publication of the UK White Paper on the Food Safety Standards Agency (1998) showed that consumers are becoming increasingly apathetic about information on food. They felt that government information was inconsistent and unclear. The balance and scale of information provided was felt to fluctuate and was therefore confusing. If they were given information about potential risk, consumers also wanted this to be backed up with clear information about action they could take to reduce that risk.

Whether these findings can be applied to the Canadian environment is a matter of conjecture. In Canada, we are moving towards investing more energy to the goal of providing Canadians with the tools they need to better manage food safety risks.

5.0 RISK COMMUNICATION: THEORY TO APPLICATION

Preceding sections of this paper deal with core aspects of theory on risk communication and public perception with a focus on the government environment and food-related risk.

While theory provides much needed insight which forms the basis for a risk communication strategy, application of theory is often subject to operational realities and constraints. The operational aspect of risk communication theory will be explored in the next few sections.

5.1 Operationalizing the theory

“Education is something we want to do to people we think are ignorant or to people who disagree with us.

Disagreement over facts or values is what divides us. In a disagreement, one ought to listen as well as speak.

Disagreeing is a two way process. Education on the other hand is comfortably one way.”

Peter M. Sandman⁽⁹⁾

Since its early beginnings in the 1980s, risk communication has been used to solve the emerging controversies surrounding risk assessment and risk management where polarization of views, controversy and overt conflict have become pervasive.⁽⁴¹⁾ Reality dictates that while risk communication may not successfully resolve all risk management issues, inadequate risk communication will most certainly lead to failure to develop acceptable public policy.

The food crisis in the UK has provided an important message to governments worldwide about the importance of proper risk communication. Risk communication can no longer be considered a simple “add-on” to risk assessment. Risk communication is an integral element of risk analysis in general and risk management decisions in particular; hence, it needs to inform thinking through the whole process of risk analysis. One of the challenges of implementing this philosophy is the need for a culture shift that embraces the concepts of openness, responsiveness, public perception, trust, participation and ethical issues at an early stage.⁽⁴⁷⁾

Governments, as already noted in previous sections, face a number of challenges when implementing risk communication strategies. These are listed in the figure below.

Government Constraints in Risk Communication

- | | |
|-----------------------------|---------------------|
| † Not a trusted source | † Accountability |
| † Resources/expertise | † Liability |
| † Political pressure | † Statutory Mandate |
| † Democratic responsibility | † Informed consent |
| | † Divided Authority |

5.1.1 Sharing responsibility

Emergence of principles such as citizen engagement and participative democracy in Canada demonstrate a commitment toward a culture shift that entails two-way interactive discussion and varying levels of public involvement in decision-making. It recognizes that a central premise of a democratic society is to make public decisions in a manner that protects the rights of the individual, but is responsive to the shared needs of all, governments and citizens. Operationalizing such a culture shift does, however, pose a number of fundamental practical challenges to government.

Procedures for assigning responsibility for making government risk management decisions are complex and often limited by statutes and political responsibility. Government agencies with the responsibility for managing risk and making decisions cannot voluntarily offload this responsibility to another party. In addition, accountabilities for managing food safety risks are often shared between different governments (local, federal, provincial), increasing the complexity of any decision-making process.

For example, Ron Doering, President of the Canadian Food Inspection Agency, points out the difficulties associated with fragmentation of responsibility for food inspection activities. Consumers faced with food-borne illness risk do not generally focus on whether the problem was created by a lapse in a federal or provincial food facility, regardless of the fact that in Canada regulation of these facilities falls under different jurisdictions. This may be further aggravated by the phenomenon known as the branding paradox which is described below. Risk communicators must be prepared for situations where the public chooses to hold federal ministers politically accountable for risks for

which they have no real responsibility⁽⁴⁸⁾. Clarification of mandate and responsibility, together with public commitment to partnerships, could be positive steps towards avoiding negative public perceptions due to fragmentation.

These factors place inherent limits on what agencies can do in discussing risk issues with citizens. Government, unable to truly share responsibility with outside groups, remains publicly accountable for decisions made.⁽⁴⁹⁾

Involving the public directly in managing issues leaves governments with the central dilemma of trying to share authority through public input into the decision-making process without sharing responsibility for the outcome. Whether citizens can be held accountable for decisions reached jointly with government is questionable at best.

The National Research Council (NRC), in its 1989 study on improving risk communication, summarized one important conceptual difficulty in the phrase: "Openness is not the same thing as empowerment." The NRC study concludes that in situations where the public is invited to participate in decision-making, it is the risk manager's responsibility to be as clear as possible at the outset about where the line is drawn with respect to level of participation and impact of public views on any particular issue. Outside participants in public discussions on issues need to understand the limits of their involvement at the outset in order to avoid unrealistic expectations.⁽⁴⁹⁾

This subtle but distinctive restriction on public input into government decision-making may appear to minimize citizen engagement as an effective means of incorporating citizens' wishes and views into public policy. Despite the apparent conflict, however, practitioners' experience leads us to believe that engaging citizens in discussions on policy-making or on high visibility controversial issues is not only necessary, but also a very effective means of developing public policy. The Honourable Andy Scott, Solicitor General of Canada, in a speech to the Institute on Governance in 1998, described his experiences engaging citizens on extremely controversial issues related to the correctional system. In his experience, it is not necessary to promise to deliver anything, but merely to promise to listen and learn to ensure a mutual understanding of the issues. All parties need to hear opposing views and see the choices that need to be made with all the competing interests in the same room. Common myths such as, "People don't really want to be consulted, they just want their own way," or, "If you don't do what they want you to do, they will never accept citizen engagement as valid," are simply not true.⁽⁵⁰⁾

Citizens, however, need to know that their viewpoints will be seriously considered when decisions are made.

Important lessons may be learned from the CFIA's experiences with federalism and globalization in the areas of food inspection, animal health and plant protection and in international trade agreements, as discussed by Ronald Doering in his 1999 paper on accountability across levels of government.⁽⁴⁸⁾ If governments can cooperate successfully across levels of government in the areas noted above, without jeopardizing traditional accountability mechanisms, it is certain that

government can find ways to cooperate with its citizenry to achieve similar goals in risk decision-making.

a. Paradox of government public relations

Traditional communication activities incorporate public relations as an integral part of any corporate communications strategy. Governments too take part in promotional activities with the goal of increasing the public's awareness and understanding of departmental programs and new initiatives. The paradox of government public relations activities becomes obvious when the increasing profile of a department or agency, resulting from its communications activities, has the effect of amplifying the roles and responsibilities of organizations in the eyes of the public. This amplification of responsibility can reach the point where an organization is held publicly accountable for events outside of its true mandate and responsibility. For example, in the case of the CFIA and its jurisdiction in the area of food safety, the public when faced with food-borne illness resulting specifically from poor handling practices at the hotel, restaurant and institutional (HRI) level, may believe that primary responsibility rests with the CFIA when in fact primary responsibility generally falls within municipal jurisdictions.

5.1.2 Trust and transparency

Trust in itself entails a measure of “risk”. Those who trust have to be willing to be vulnerable to individuals (or institutions).

D. Metlay⁽⁵¹⁾

Modern risk communication research points to “trust” as a key principle in effective risk communication. Transparency or openness, as it is often referred to, is only one of many interrelated elements leading to public trust and confidence in institutions. Daniel Metlay, in a recent study on levels of public trust and confidence in the US Department of Energy, found that the “affective” elements of risk (i.e., openness, reliability, integrity, credibility, fairness and caring) had roughly four times the impact of the “competence” component of risk in predicting public trust and confidence in this particular institution. His research clearly demonstrates the complexity of the relationship between affective and competence components of trust and the added impact of “values” on this relationship.⁽⁵¹⁾

Recognizing trust as an important aspect of risk communication is only one step toward establishing the practical operational aspects of what an institution must do to increase the public's trust and confidence in it.

Transparency and full disclosure are terms that are commonly used to characterize components of

governments' new culture of public involvement and participative decision-making. In theory, the concept of openness and information-sharing seems as simple as "sharing everything". Putting this into practice, however, one encounters several obstacles that are framed by both ethical and practical problems.

A central premise of democracy is the existence of an informed electorate. However, while the public's "right to know" must be respected, providing information to the public entails an appropriate balance between the need for openness and access and the need for confidentiality and protection. Suppression of relevant information is sometimes an easy choice for decision-makers; experience has shown, however, that this is not only wrong but is usually, over the longer term, ineffective.⁽⁴⁹⁾

Openness and transparency in fact embody much more than just the transfer of information and facts. Jan Gutteling has pointed out that presenting facts alone will in fact do very little to bridge the gap between the public's actual and subjective evaluation of risk, and will certainly not lead to the desired objective of citizen engagement, which is mutual understanding. Dr. Ortwin Renn of the Centre for Technology Assessment in Stuttgart, Germany provides insight based on his research models of citizen participation. Dr. Renn reiterates the view that knowledge alone will not achieve acceptable decisions about risk. Public views and values are integral to the process: "As long as value issues remain unresolved, even the best technical expertise and the most profound competence cannot overcome social, cultural and political value conflicts."⁽⁵¹⁾

Transparency is often mistaken for full disclosure of information. Aside from issues of confidentiality already mentioned, full disclosure can be a two-edged sword. In fact, providing the public with too much information can lead to "information overload", a phenomenon that has best been described in more scientific terms as "exceeding the cognitive and emotional capacity of the audience to handle information." Communications theorists Richard Petty and John Cacioppo claim that people today are exposed to so many persuasive messages that we have developed mechanisms to filter information and focus only on those messages that are personally relevant.⁽⁵³⁾ Once again we see the need for balance in applying transparency. Providing too much information can be as ineffective as not providing enough.

5.1.3 Source credibility

The evolution of society as a complex structure has forced individuals to put their trust in government systems set up to address the hazards and risks of everyday life.

It cannot be denied that source credibility is an important factor in risk communication. Previous sections of this paper have discussed its influence on the public's acceptance of risk messages. Partnerships with trusted sources to

"A certain level of distrust is a healthy manifestation of democracy at work, and is here to stay."

R.B. Foster (2000)⁽²⁹⁾

disseminate and develop messages remain a successful and practical means of improving the credibility of risk messages.

A 1998 study by O'Connor et al. on public views with respect to risk mitigation and trust in risk mitigators provides some reassurance that lack of trust in government and experts by the public is not as static as the theory would suggest. From a policy perspective, this leaves the door open for public education and risk communication. O'Connor et al. conclude that:

- “1. The American public is not polarized in terms of opinion on mitigation approaches (i.e., *one group fervently rejecting the efficacy of any potential mitigator and another group certain that scientists and governments or individuals themselves can reduce threats to society and individuals*).
- 1.1.2 Findings did not reveal a cynical public united in anti-expert and anti-government consensus. (*Except for violent crime and automobile accidents, more people agreed that scientists and other experts can find ways to significantly reduce threats than disagreed. Most people think individuals can do a lot to reduce health threats, concluding that there may be widespread distrust in government but there is also a widely shared opinion that government spending may reduce specific threats.*)
- 1.03 Faith in experts was not found to be variable based on demography, culture, environmental values, political opinions, and judgement of the severity of the problems.”⁽⁵⁴⁾

In Canada, survey information from the Canada Information Office (2000) reveals that the relationship between government and the Canadian public is in fact quite complex and depends on a number of different influencing factors. Data from the survey indicate that the public's opinion of government changes based on the specific factor evaluated. Government was viewed favourably in the areas of leadership, service to the public and economic management, but was viewed less favourably with respect to their ability to listen to citizens, manage operations cost-effectively and be accountable to the public.⁽⁵⁵⁾ Clearly, generalizing the issue of credibility of government as a whole does not do justice to the complexity of the relationship.

The credibility of “experts” in informing and reaching decisions about risk can also be controversial and seems to be undergoing an evolution of its own. Traditionally risk managers could legitimize decisions on the sole basis of advice from expert sources. Because the public is increasingly distrustful of science, this no longer seems to be the case and the role of experts in risk management decision-making involving the public must be made clear from the outset. Today, experts should continue to bring academic thinking to bear on a problem and present what is known or not known; however, their role in prescribing the risk management solution should be diminished.⁽²⁹⁾

Depending on the level of risk debate, and the nature of decision, occasions will arise where experts necessarily become spokespersons. This role remains a critical one in the day-to-day management of risk.

5.1.4 The challenge of resources and capacity

The challenge of limited resources has led governments to set operational priorities for allocation of resources towards risk, and to ensure that resources are being used in the most effective manner possible. For example, decisions related to the investigation of allegations of risk or hazard often include considerations around cost and budgets. The relative benefits to the community need to be considered together with the risks. Resource allocation for the investigation of health scares often involves diverting money from one budget to another.⁽⁵⁶⁾

The shift in culture towards openness and engagement brings with it its own resource implications. Experience has shown that engaging in any form of public consultation is both time-consuming and resource-intensive. Different forms of citizen involvement range from focus groups to citizens' juries to Internet forums. Each initiative will entail a different level of resource use. Jocelyne Bourgon, former Clerk of the Privy Council of Canada, suggests that the enormous time and resource commitment associated with full-blown citizen engagement dictates that this form of public involvement be used selectively for issues having a broad impact on the public or involving difficult choices about fundamental values.⁽⁵⁷⁾

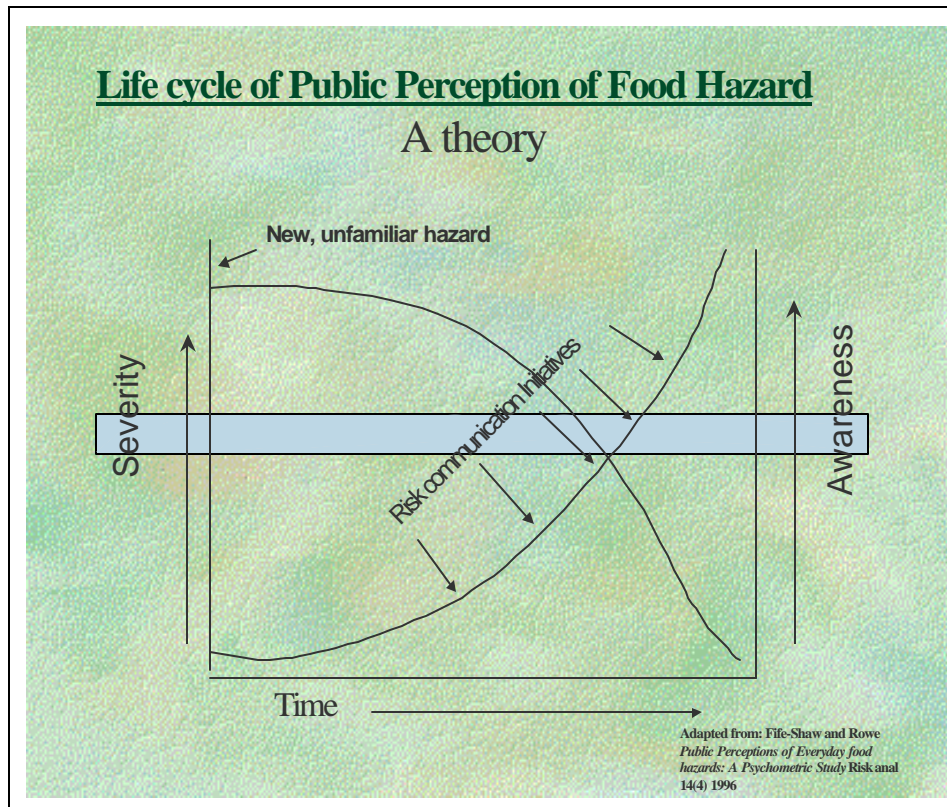
Capacity of personnel is an equally important factor in effective risk communication as availability of personnel. Government staff must be provided with the necessary skills to effectively engage citizens in discussions about risk.

The nature of the decision clearly guides the scope and intensity of any public participation process or the "level of risk debate". Clearly an agency cannot consult intensively on all issues. The CFIA's Risk Management Framework recognizes that "in situations where there is an urgent need for immediate action, where the optimal course of action is obvious, where the issue is entirely or mainly technical, or where the issue is trivial or routine, consultation before action is both unnecessary and inappropriate."⁽¹²⁾

5.1.5 Risk perception versus reality

Perception, as the previous section on theory demonstrates, has an important influence on risk communication strategies. But perception is an extremely complex area of study and often the information and expertise needed to adjust communication strategies to meet the needs of the public are not readily available. Risk communication strategies must be flexible and responsive to changing public perceptions.

Chris Fife-Shaw and Gene Rowe, in their 1996 study on public perceptions of everyday food hazards,⁽⁴⁴⁾ discuss the transient nature of public perception. Issues or activities tend to have a life cycle of their own, based on the novelty of the activity and the uncertainties around the risk. The figure below shows the change in perception of the severity of a hazard over time as awareness or familiarity with the hazard increases.

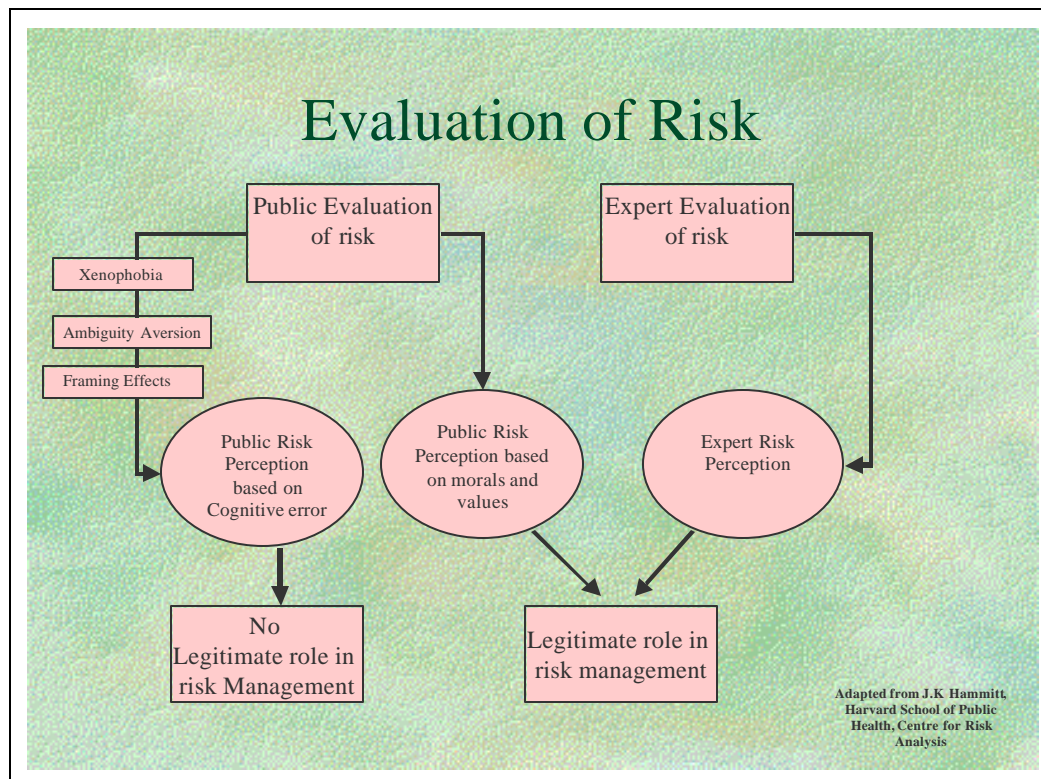


For example, in the United States, attitudes towards food irradiation as a new technology seem to have become more accepting as the uncertainties around this technology seem to have decreased over time. Risk communication initiatives such as public education, and general exposure to information including media coverage on food hazards, will inevitably help to change perceptions of a hazard over time.⁽⁴⁴⁾

Theory points to the impact of individual factors such as source credibility and heuristic bias on the effectiveness of messages. Often these factors combine to alter the public's receptiveness to messages and thus, their ultimate effectiveness. A 1997 study by Frewer et al. demonstrates some interesting trends in source credibility and its impact on perceived risk. Participants in this study perceived risk to be lower if information came from a government (less credible) source. This means that the risk is likely to be disregarded because it is not seen as threatening. At the same time data showed that the magnitude of the optimistic bias effect was also reduced if information came from the government source.⁽⁴⁵⁾

The dilemma faced by risk communicators is that, while information from a trusted source may result in a risk being perceived to be higher, it also leads to a greater optimistic bias effect, which suggests that people will ignore the messages because they see the risk applying to someone else.⁽⁴⁵⁾

The role of the public's perception of risk is important in developing risk communication messages, goals and strategy. Perception, however, can be categorized based on its influencing factors and motivations. James Hammitt of the Centre for Risk Analysis, Harvard



School of Public Health, presents some controversial work which comes to the conclusion that not all public views about risk should be considered as valid in making risk management decisions. Hammitt makes the distinction between public evaluation of risk based on cognitive error (illegitimate biases such as intolerance of the unfamiliar, uncertainty about the size of risk, over weighing of small probabilities) and public evaluation of risk based on sound moral argument. Hammitt goes on to suggest that public evaluation of risk based on cognitive error in fact has no legitimate role in risk management, and should not be accepted as a legitimate basis for social decisions.⁽⁵⁸⁾

Hammitt's logic, which is summarized in graphic form above, may indeed prevail in a majority of cases. Nevertheless, practical realities of risk decision-making based on any rational discourse model of public involvement, provides ample evidence of situations where the high level of public outrage directs decision-making towards alternatives that do not coincide with either logical adherence to objective facts, or sound moral argument.

5.1.6 Setting goals

“Risk communication serves three main objectives:

- *to make sure that all receivers of a risk message are able and capable of understanding the meaning of the message;*
- *to persuade receivers to change or modify their behaviour; and/or*
- *to provide the conditions for a two-way communication process as a means to resolve risk conflicts.”*

Ortwin Renn ⁽⁵²⁾

The success or failure of a risk communication strategy can hinge on setting clear goals. Goals will vary widely depending on the nature of the risk and may include informing, educating, persuading, negotiating, reassuring and warning. Strategies employed to achieve these goals may involve two-way and interactive discussion or may simply be one-way and directive in nature. Some theorists suggest that persuasive or directed communications is not an appropriate means of risk communication. Reality dictates, however, that these forms of communication have a legitimate place in the general risk communication model. Gutteling and other researchers point out that directive or persuasive communication which attempts to manipulate or direct behaviour can in fact be appropriate in cases where citizens are faced with large and immediate dangers or lifestyle hazards. In addition, these forms of communication may be appropriate where the urgency of decision simply does not allow for a lengthy two-way interactive engagement of the public.

In the case of the CFIA’s activities related to food risk, informing the public about risks (for example, food recall) and demonstrating the hazards of dangerous food handling habits, are both mandated and beneficial tasks.

Persuasive techniques are clearly not appropriate in all situations, and can easily be interpreted as manipulative when used to influence public values. Where more fundamental public values are at stake, risk communication goals should reflect a two-way exchange of information, leading to a common approach to risk issues and a common influence on risk decisions. In cases where the public perceives that it is being manipulated, loss of trust and public outrage can be the only outcome.

5.1.7 Developing Messages

“The perceived accuracy of a message is hampered by the following:

- real or perceived advocacy of a position not consistent with careful assessment of the facts;
- reputation for deceit;
- misrepresentation or coercion;
- previous statements or positions that do not support the current message;
- self-serving framing of messages;
- contradictory messages from other sources;
- actual or perceived professional incompetence and impropriety”.

National Research Council, USA, 1989⁽⁴⁹⁾

Developing and targeting messages is important in risk communication. The perceived accuracy of messages from regulatory agencies is commonly plagued by these factors, as presented by the NRC in its 1989 study on improving risk communication.⁽⁴⁹⁾

In addition, agencies developing messages about risk must be aware of how presentation can influence the public’s understanding of risk messages. Different ways of framing messages can lead to vastly different conclusions. People will use their own individual frames of reference to define issues, often resulting in completely different approaches to risk. For example, presenting data in terms of numbers of illnesses can be interpreted completely differently from the same data presented in terms of numbers not falling ill.

Risk comparison is a method commonly used to display the magnitude of risk. These comparisons are generally designed to help the public better understand the size of a risk by providing a familiar term of reference. Risk comparison, however, remains a very controversial subject among risk researchers. Some insist that magnitude is only one factor shaping how the public reacts to risk and therefore is not a useful tool, and may in fact falsely influence those participating in the risk management debate.

Others in the field of risk management contend that risk comparison can indeed be a useful tool by providing a familiar point of comparison for an unfamiliar hazard. Risk comparisons must not be associated with claims of risk acceptability, however.

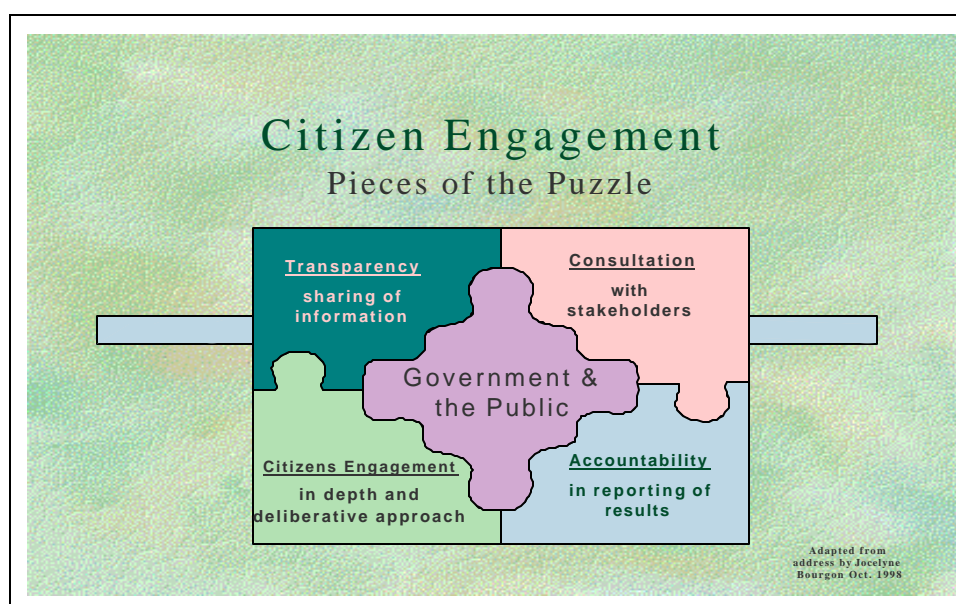
Clearly, tailoring risk messages for the public is a complex task in which the relationship between the messenger and the public becomes a critical pivotal point upon which the acceptability of the

message is founded.

In the case of food-related risk, the communications strategy must include targeting messages to various sectors involved in food-related activities. While the term “public” is often widely interpreted to include all sectors of society, the target audience must be distinguished in terms of the form and nature of risk communications messages, between the public as citizens or consumers, and industry, trading partners and producers.

5.1.8 Incorporating public input

The importance of public dialogue, in order to determine where the public concerns lie around risk tolerance, social and ethical values, becomes clear when developing a process and methodology to address risk appropriately. Public input is vital to effective risk communication. Building a risk communication strategy hinges on building effective relationships among all parties who form critical components in the risk communication network. This includes social and political institutions, media organizations, the public and decision-makers.



Engaging citizens in risk-based discussions is not always a simple task. Branden Johnson of the Bureau of Risk Analysis, New Jersey Department of Environmental Protection, has reviewed ethical issues in risk communication. He points out that citizens when faced with the opportunity to participate in decision-making may actually feel pressured, on the one hand afraid to lose the opportunity, yet on the other hand reluctant to accept the burden and responsibility of participating in the decision-making processes. Johnson claims that citizens may delegate authority or responsibility for decisions for a number of reasons including: deference to expertise, lack of time or interest, suspicion of their own powerlessness or ignorance of their potential power. He goes on to state that “pressuring citizens to take a greater role in decision-making will place different

burdens on them, according to which of these reasons explains their current level of participation and thus will pose different kinds of challenges for risk communicators.”⁽⁵⁹⁾

Public engagement with stakeholders seems to be a trend that is on the increase; however, as R.B Foster notes from the UK experience, engagement is not necessarily always easy or comfortable. It is inevitable that some stakeholders will be disappointed in the outcomes; their only consolation will be that they were able to participate in a transparent process in which all views have been heard constructively and taken into account.⁽²⁹⁾

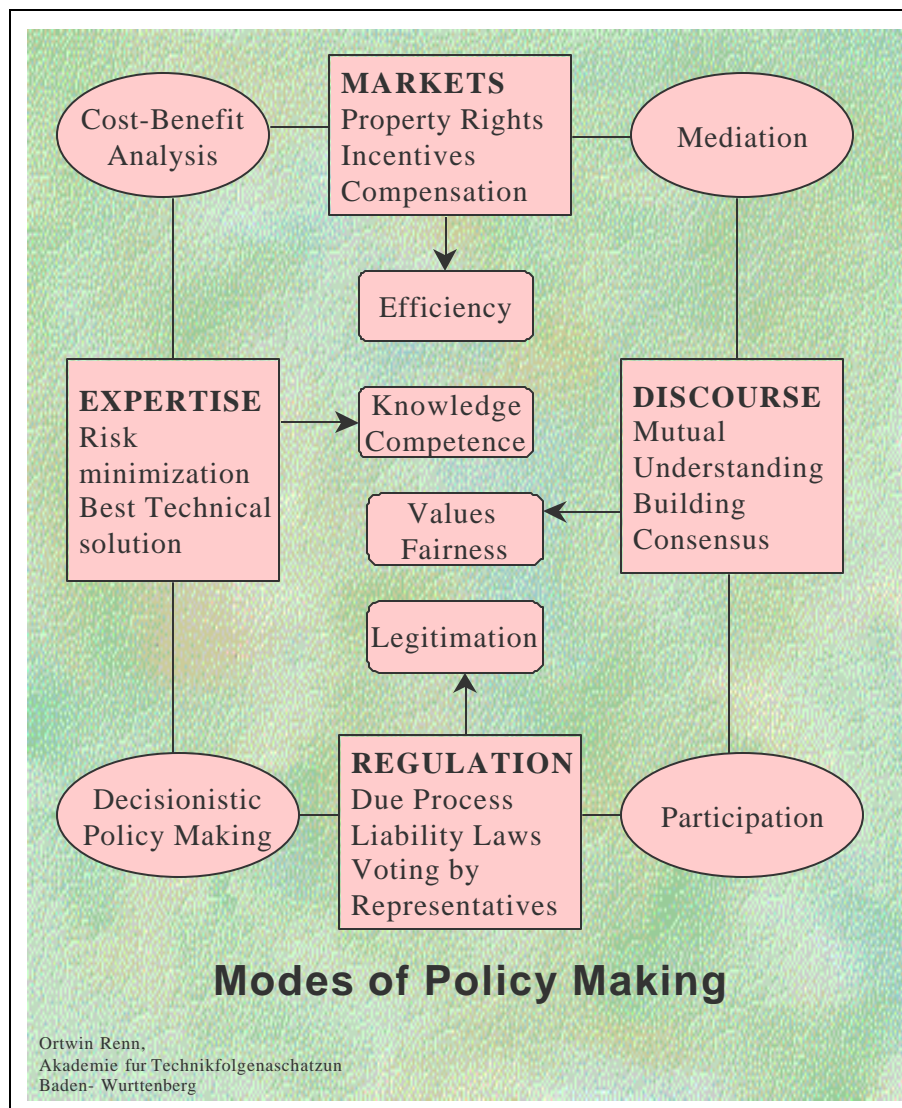
Among the many processes of incorporating public views and opinions, the process of citizen engagement is at the extreme end of the scale in terms of intensity. The goal of a citizen engagement process goes beyond a simple snapshot of public opinion or providing an opportunity for airing fixed views. Meaningful engagement of citizens has been described as a serious, substantive and deliberative process that allows citizens to fully consider and debate matters under consideration. It includes in-depth discussion of choices and tradeoffs in the search for common ground.

6.0 A RISK COMMUNICATION MODEL

The following section of the paper consolidates theory with operational reality in developing a generic model for risk communication and subsequent policy development.

6.1.1 A horizontal approach

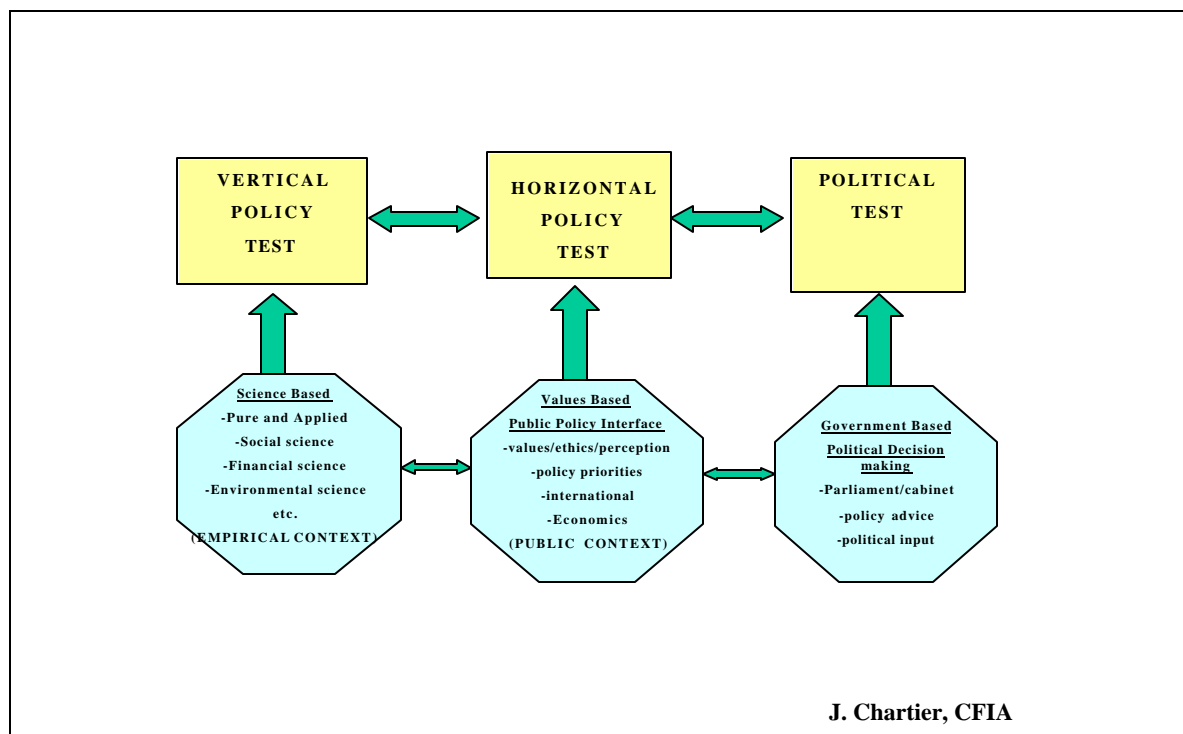
Dr. Ortwin Renn presents a model of policy-making that incorporates the concept of deliberation and the principles of deliberative processes. Renn's model, presented below, identifies the different inputs into policy-making and risk decisions, together with four different modes which exert influence on the overall process.



He identified four key elements — markets, expertise, regulatory regimes and public discourse. These elements act not only to influence policy-making but they also call for the use of different modes of action. These are characterized in the model by cost-benefit analysis, mediation, participation and actual decisional policy-making.

The essential concept behind this model is that mutual understanding and consensus-building are the best ways to address the elements of values and fairness in risk decision-making. This in turn forms the foundation for public trust and confidence in public institutions. Because objective facts are not always the basis for decisions, as seen in previous sections of this paper, participation and citizen engagement in policy-making is necessary in the formation of acceptable public policy.

Theory dictates that a successful model for risk communication must reconcile the views of scientists, the public and politicians in order to achieve a common understanding of complex risks leading to credible management options and credible policy development around risk.



The interface between science (or technology), politics and horizontal government priorities and the public, including socio-economic dimensions, is critical. The schematic below illustrates integral phases in developing policy options and decision-making. The vertical policy test (or challenge) is constructed purely on a science base (for assessment of risk). The horizontal policy test is based on the public policy interface and provides the integral horizontal link between science and politics. The political test takes into account influences and pressures at the ministerial and parliamentary levels that are integral to any decision-making process.

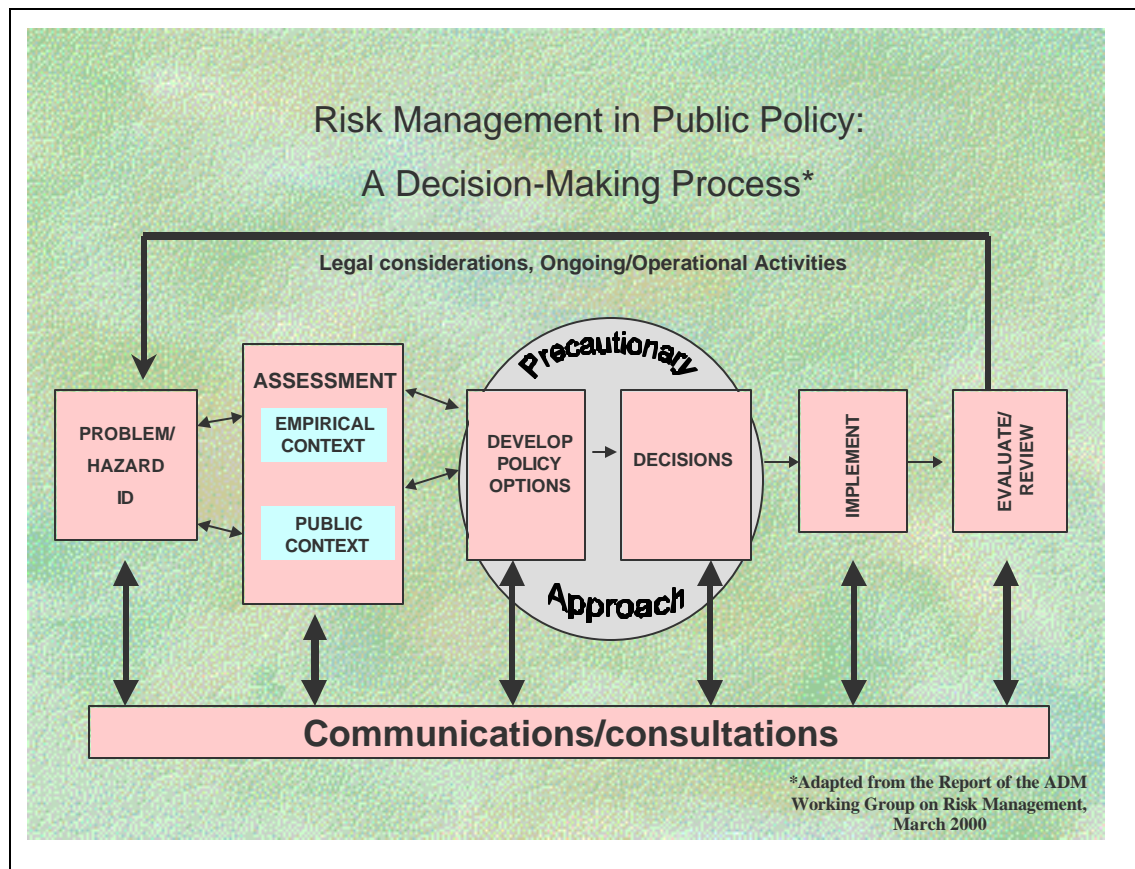
Without the “horizontal test”, the communications gap between science and politics is likely to widen. This disconnect can result in serious failure in managing risk.

The horizontal policy test must consider the needs of science, as well as of the public and political

leaders (such as horizontal governmental priorities), and reduces the gap in understanding and enhancing communication between these diverse groups. A strong public policy interface incorporates the public context (including socio-economic dimensions of decision), and provides an essential understanding of the role that factors such as fear, emotion, public perceptions and tolerance and government priorities, play in political pressure on governments (politicians) to modify their approach to risk management.

6.1.2 Risk communication in public risk decision-making

In March of 2000, the government's Assistant Deputy Minister (ADM) Working Group on Risk Management released its report, *Risk Management for Canada and Canadians*. This study presented a model of public risk management decision-making in which communication and consultation activities formed a constant consideration throughout the decision-making process. The CFIA has adapted the model, which appears below, highlighting the aspect of communication within each phase of decision-making.



The report of the ADM Working Group on Risk Management recognized that stakeholder involvement is the key to building both acceptance and understanding of government policy decisions. Communications challenges were identified as:

- the importance of perception or assessments;
- the degree of public tolerance of risk;
- the role that pro-active risk communication can play in building public understanding of risk and management of risk; and,
- the need to gain/maintain public trust and its impact upon the credibility of government messaging.

The recommendations in this report recognized that risk communication is an area requiring significant further work and also suggest that central agencies should work together to ensure that risk communication and consultation practices are integrated into the Government of Canada communications policy. Capacity building and training were highlighted as areas for further focus, together with the development of appropriate mechanisms for integrating risk communication into policy-making.⁽²⁴⁾

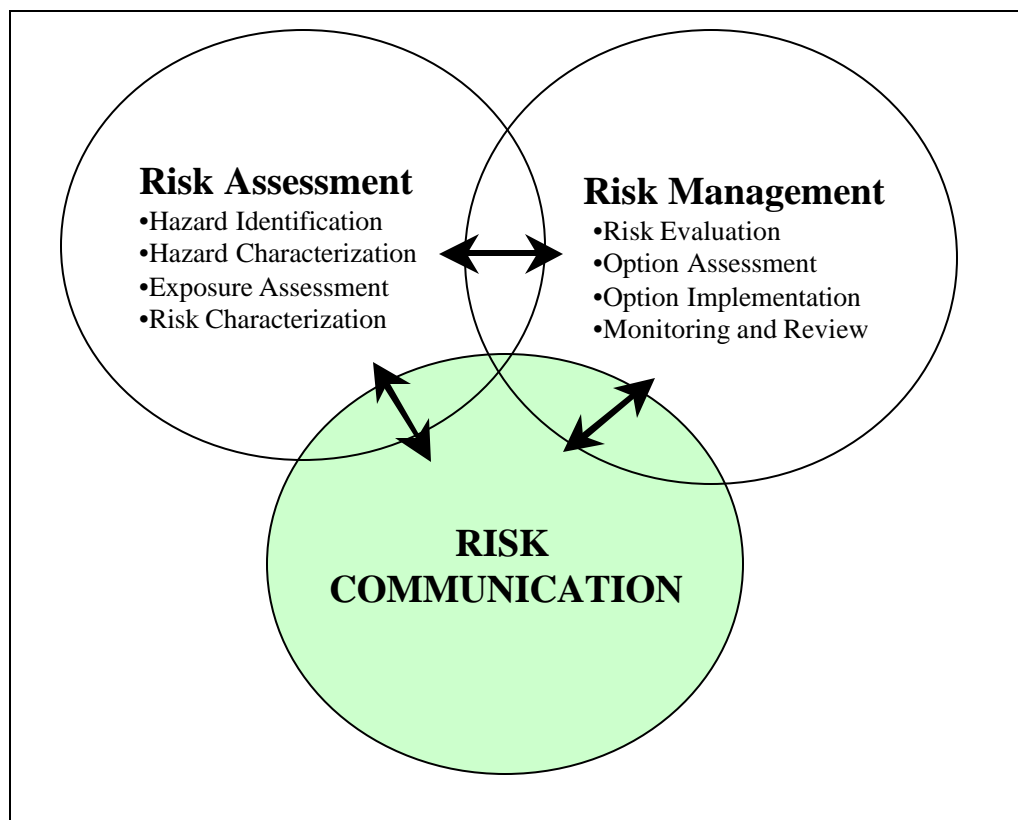
The CFIA has adopted the internationally-accepted risk analysis framework which embraces three separate components of risk analysis:

Risk Assessment: determining the degree of risk involved

Risk Management: establishing if and what measures are required to mitigate risk

Risk Communication: ensuring that all stakeholders are involved in the process

The framework is presented below.



6.1.3 Science advice

For the CFIA, communicating about science is a cornerstone of communication about risk. Earlier sections of this paper discussed the importance of communication as part of the science-policy interface. The Government of Canada, recognizing the need to ensure the effective use of science advice in making policy and regulatory decisions, recently released a report on Science Advice for Government Effectiveness (SAGE) prepared by the Council of Science and Technology Advisors, a council composed largely of external experts. The six key principles and guidelines contained in the report are intended to improve effective use of science advice with the goal of reducing a science-related crisis of public confidence.⁽⁶⁰⁾

The fourth principle in SAGE acknowledges current theory on communication of scientific uncertainty by suggesting that “science advisors and decision-makers need to communicate to the public and stakeholders the degree and nature of scientific uncertainty and the risk management approach utilized in risk decisions.”⁽⁶⁰⁾

The fifth principle endorses the need for openness by encouraging governments to employ decision-making processes that are transparent and open to stakeholders, showing clearly how decisions are reached. The report goes on to reiterate the need for public discourse to ensure that public values are considered when formulating policy. Early and ongoing consultation, both within government and with the public, is recommended.

6.1.4 Communications model

Developing a single model that would embrace all the aspects of the “nature of decision” (from singular food recall situations to policy-making decisions to high visibility and controversial issues management) and all aspects of communications strategy (from providing information to promotion, education and two-way consultation) is, to say the least, a formidable challenge.

Reality demands that the “nature of decision” dictates to a large extent the course of action in any risk management situation. Managing a food recall due to a serious hazard, for example, often calls for the rapid transfer of information in the form of warnings rather than engaging regulators in extensive two-way consultation. (A single recall is a defined activity within a broader risk management framework, of course. What must be consulted and what inevitably leads to the success of the process, is the broader framework for recall strategy or emergency response.) The nature of the decision leads to the goal of the risk communication and the strategy for action. Food recall communications require rapid response, clear and coherent messages and openness in information-sharing. Public response, as usual, will depend largely on the public’s confidence in the messenger.

Nature of decision leads naturally to discussions on “level of debate”. The combination and integration of the three key levels of debate described in the research of Renn and Levine (1991) provides the basis for developing a risk communication strategy. The table below sets out the three levels of risk debate and describes the main goal, the focus and the challenges inherent in each level. ⁽⁶¹⁾

LEVELS OF RISK DEBATE

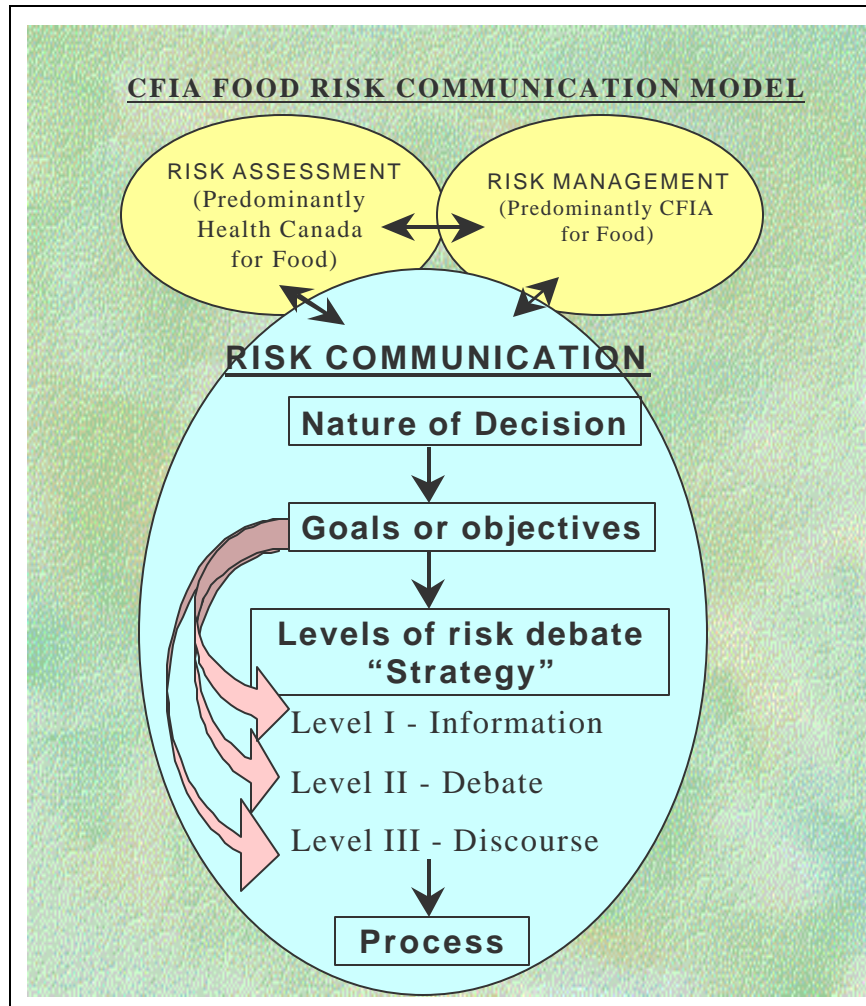
(Renn and Levine, 1991)⁽⁶¹⁾

Three Levels of Risk Debate (Renn and Levine 1991)	Main Goal	Communications Focus/needs	Challenges
LEVEL I Provision of technical knowledge (factual arguments, risk probabilities, potential damage)	INFORMATION TRANSFER social marketing education public awareness	-Inform the public -Mostly one-way Information transfer -Two-way only to ensure that message is understood and concerns addressed	-Framing messages -Message clarity -Effective use of channels -Urgency/speed
LEVEL II Debate regarding institutional competence to deal with risks	PUBLIC INVOLVEMENT Dialogue with stakeholders and the public	-Distribution of risk and benefit -Trust in risk management institution -Evidence that mandate has been met and performance meets public expectations	-Demonstrating competence (source credibility) -Gaining/maintaining trust
Level III Social values, cultural lifestyles and their impact on risk management	DIALOGUE-BASED MODELS OF COMMUNICATION RATIONAL DISCOURSE ⁴ Mediation citizens panels consensus conferencing	-Decision-making requires a fundamental consensus on issues that underlie the risk debate. -Risk information and two way dialogue are insufficient to find a solution	-Fair representation of all affected parties -Voluntary agreement to obey rules of rational discourse -Inclusion of best available expertise Clear mandate

Having decided on the level of risk debate, the risk communicator must then turn to the mechanics of the risk communication process, and focus on methodology, tools, channels and communications products.

The diagram below illustrates the natural flow of risk communication decisions within the framework of the risk analysis model adopted by the CFIA.

⁴Discourse: a special form of dialogue in which all affected parties have equal rights and duties to present claims to test their validity in a context free of social or political domination (Renn, 1998)⁽⁵²⁾



Within the CFIA, food risk communication closely follows the framework described above. Much of the effectiveness of CFIA communications is based on the alliances forged between the agency and its many partners, including stakeholders, governments at all levels and special interest groups. Shared jurisdiction and source credibility have combined to compel the agency to maintain and nurture these partnerships in order to fulfill its mandate.

The table below provides examples of food risk communication within CFIA and the application of the model above.

SOME EXAMPLES OF CFIA FOOD RISK COMMUNICATION

Nature of Decision	Range of Goals/ or Objectives	Primary Level of Risk Debate	Process/ Activities	Product Examples
Emergency Management e.g., Food safety recall High visibility issue	<ul style="list-style-type: none"> Providing direction and behavioural guidance in emergencies Increasing public awareness of risk Reassurance 	Level I: INFORMATION TRANSFER <ul style="list-style-type: none"> Largely one-way Two-way to ensure messages have been received/acted on, and to adapt and develop communications to meet audience needs and as the situation develops NOTE: Also two-way during investigation phase (consumer complaint-driven)	Partnerships with parties in information dissemination/distribution. <ul style="list-style-type: none"> Joint news conferences/ media briefings Media outreach to enhance communication efforts 1-800 information lines Web, phone, and mail enquiries 	<ul style="list-style-type: none"> Food safety alerts Food recall public warnings (news releases) Backgrounders Fact sheets Questions & Answers, etc.
Consumer Awareness/Education e.g., Partnership for Food Safety Education (<i>FightBac!</i> ™ campaign)	<ul style="list-style-type: none"> Informing and educating people about risk and risk assessment in general Encouraging personal risk reduction behaviour Increasing public awareness of risk Social marketing 	Level II : INFORMATION TRANSFER/DIALOGUE <ul style="list-style-type: none"> Both one-way (factual background information) and two-way to ensure messages understood, concerns addressed, and appropriateness of messaging and communication channels 	Build partnerships with credible sources and in areas of shared responsibilities/ jurisdiction/common interest <ul style="list-style-type: none"> News conferences/ media briefings Focus groups Public opinion research Media outreach Feedback mechanisms (internal/external) Web site 	<ul style="list-style-type: none"> Fact sheets Brochures Posters Public displays Articles for community newspapers/ specialty publications
Policy Development: corporate directions and priorities, legislation/regulation Risk management e.g., biotechnology labelling, HACCP	<ul style="list-style-type: none"> Identify hazards/problems Develop options for risk management Increase trust and credibility in decision making/policy making Assess public context of risk Resolve conflict 	Level II & III: Range from CONSENSUS-BASED MODELS to DIALOGUE BASED MODELS OF COMMUNICATION <ul style="list-style-type: none"> Citizen engagement 	Participate in partnership with other parties in areas of shared responsibility and common interest. <ul style="list-style-type: none"> Consultation (Web site, stakeholder meetings, focus groups, etc.) Feedback mechanisms (internal/external) Negotiation/mediation Other forms of public involvement 	<ul style="list-style-type: none"> Information bulletins External newsletter Corporate presentations Decision documents

Conclusions

Risk communication is truly a complex and emerging science that will continue to evolve as research adds to current knowledge. Researchers and practitioners are quick to point out that no one form of risk communication will satisfy everyone; however, it is possible to align the theory in a predictable way and thus, build an effective risk communication strategy.

Basic concepts of communication embrace both scientific and humanistic views of the world as outlined in the table below.

Alignment of Theory⁽⁵³⁾

Scientific theory	Humanistic theory
Explanation of data	Understanding of People
Prediction of Future	Clarification of Values
Relative simplicity	Aesthetic appeal
Testable hypothesis	Community of Agreement
Practical Utility	Reform of society

Behavioural sciences are key to the basic understanding of how we communicate. The focus on values, as the key elements which guide us in setting priorities that direct what we think, feel and do ⁽⁵³⁾, are integral not only to communications as a field of study, but also to risk communication.

Despite its evolution from the science of risk assessment, risk communication could accurately be described as a subset of communications science. While communication has been described as the “management of messages for the purpose of creating meaning”⁽⁵³⁾, risk communication then becomes the “management of messages about risk for the purpose of creating meaning.” Strengthening the bridge between communications theory and risk communication could be beneficial to this emerging science.

As the authors explored current theory and practice in risk communication, a single salient point appeared repeatedly—the issue of trust and credibility. Clearly, the relationship between the source of the communication and the recipient must be acknowledged as one important factor, if not the most critical factor, in effective risk communication.

The evolution of practice in risk communication comes from an understanding that communication is more than just the transfer of information. It can only be termed “communication” if the message has been transferred and understood. This leads to an increased understanding and acceptance of the importance

of two-way dialogue in risk communication. Even when the goals of communication suggest the need for one-way transfer of information (as in emergency management), it is critical to obtain feedback from the recipients in order to ensure that the message has indeed been understood.

The move towards dialogue-based risk communication naturally entails a culture shift, not only for governmental organizations but also for non-governmental organizations and the public. All parties must be willing to move from advocacy to shared decision-making and from being passive recipients of information to being partners.

Psychometric research has provided a wealth of information on how people perceive risk. As a result, there has been a shift in emphasis from purely science-based decision-making to a more balanced method of decision-making which understands that public assessment of risk, public views and values are critical to decision-making around risk and ultimately to communication about the process. The link between risk-based decision-making and risk communication must be well understood in order for the risk management process to achieve its objectives and for the development of effective public policy.

“Nature of decision”, as described in this paper, forms the basis for risk communication with respect to developing goals, strategy and process. In the practical application of risk communication, the nature of decision leads to a clear definition of the appropriate level of debate around a specific issue.

The context of risk communication must be taken into account in the development of an effective communications strategy. We have shown that issues of a scientific nature—including those related to food—present particular challenges to communicators. Effective communicators must find ways to formulate messages around complex science-based issues so that the messages are understood. Pre-formed attitudes and perceptions must be understood and acknowledged when framing messages. The challenges of innumeracy, heuristic and other biases add to the difficulty of communication about risk. Nevertheless, these perspectives need to be recognized in order for communications to be successful.

Researchers have demonstrated that public attitudes and judgements are formed over time in very specific stages. This process, too, must be acknowledged by communicators as well as the influence of the actual source of communication (the media, government, or non-governmental organizations).

In conclusion, effective and successful risk communication is not just about giving out information or about making stakeholders understand. Today, successful risk communication can result when the quality of debate among government, the public and all stakeholders is improved.

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Appendix A: Glossary of Terms

The following provides definitions of some of the key terms that are used in this document. Their use and meaning in different contexts and from different sources may vary. The meanings attributed here are those used by the authors and are offered only to help understand the terms as used in the context of this paper.

Accountability: In government, accountability can be thought of as enforcing or explaining responsibility. It is often used as a synonym for “responsibility” because both are defined by the office holder’s authority; they cover the same ground. Accountability involves rendering an account to someone such as Parliament or a superior, on how and how well one’s responsibilities are being met, on actions taken to correct problems and to ensure they do not reoccur. (*From: A Strong Foundation: Report of the task force on public service values and ethics.*)

Agrarian society: a society based largely on farming or agricultural interests.

Ambiguity aversion: also known as uncertainty aversion, a tendency to choose on the side of caution when the probability of risk is not precisely known. Also, uncertainty about the size of a risk, leading to it being viewed as less tolerable.

Antagonistic cooperation: term coined to describe a consultative approach which involves in-depth engagement of stakeholders.

Apathy: attitude characterized by indifference or a lack of interest or concern.

Availability bias: the tendency to judge probability by how easily examples can be brought to mind.

Citizen Engagement: the engagement of citizens in in-depth discussions of choices and tradeoffs in search of common ground, leading to better understanding of policy proposals and/or the underlying principles upon which they are based.

Cognitive: relating to or involving the act or process of knowing, including both awareness and judgement. Cognition is characterized by the following: attention, language/symbols, judgement, reasoning, memory, problem-solving.

Credibility: defined by Webster’s Collegiate Dictionary as the quality or power of inspiring belief. When applied to an information source, credibility centres on three factors: opportunity (is the source in a position to know?) ability (does the source have the skill and competence?) dependability (is the source responsible and trustworthy?).

cyclosporiasis: an infection of the small intestines in humans caused by a microscopic parasite called *Cyclospora cayetanensis*.

Debate: to discuss or argue about an issue by considering opposing arguments.

Dialogue: an exchange of ideas and opinions.

Discourse: a term described by Dr. Ortwin Renn in the theory of communicative action, to denote a special form of dialogue in which all affected parties have equal rights and duties to present claims and test their validity in a context free of social or political domination.

Discussion: open and usually informal debate.

Dread Values: also known as “fright values”, a series of factors that trigger alarm, anxiety or outrage.

Empirical: originating in or based on observation or experiment.

Empowerment: a mechanism by which people, organizations, and communities gain mastery over their affairs.

Engagement: taking part in something.

Ethics: a set of moral principles or values.

Factual Information Model: coined by George Cvetkovich et al., in 1989, refers to a model of communication where the discrepancy between actual and subjectively perceived risk is assumed to be reduced by presenting factual information.

Fatalism: a belief or attitude that one is powerless to change something.

Framing effects: refers to the fact that it is possible to “frame” situations in different ways which may lead to different conclusions.

Full disclosure: provision of all possible information.

Hazard: a thing or action that can cause adverse health effects.

Heuristic bias: ingrained patterns of thought which can lead to personal and/or unreasoned judgement.

Information overload: provision of information in excess of the cognitive and emotional ability of an individual to process that information.

Irradiation: the application of radiation for various purposes, including reducing levels or killing microorganisms and mold in foods, killing insects and pests that infest certain foods, and sterilizing food for specific medical applications.

Lifestyle hazard: a hazard typically related to a chosen lifestyle or habits, i.e., overeating, smoking.

Mass communications: communication directed to, or reaching the mass of the people, through a range of methods such as the press (print, television, radio, Internet), advertisements, public relations, etc.

Multidimensional communications: refers to the various dimensions of risk communication, such as: political, economic and social.

Nature of decision: refers to the essential characteristics, kind or class of decision to be made. And it dictates to a large extent the course of action in any risk management situation.

Negotiation: to confer with another so as to arrive at the settlement of some matter through conference, discussion, and compromise.

Operationalize: to put into practice.

Optimistic bias: a tendency to believe that one is less at risk than the average member of society.

Outrage: anger and resentment aroused by injury or insult.

Outrage bias: a tendency to believe that one is more at risk than the average member of society.

Perception: an intuitive judgement based on personal experience, heuristics and available information.

Pluralistic society: a state of society in which members of diverse ethnic, racial, religious, or social groups maintain an autonomous participation in and development of their traditional culture or special interest within the confines of a common civilization (Webster's New Collegiate Dictionary).

Polarization: showing two contrary directions and tendencies.

Populism: a belief in the rights, wisdom, or virtues of the common people.

Precautionary Principle: a principle often invoked in the fields of environmental protection and human health when dealing with risk situations where there is significant scientific uncertainty and a potential for serious, irreversible or cumulative harm.

Rational discourse: described by Dr. Ortwin Renn as a special form of dialogue in which all affected parties have equal rights and duties to present claims and test their validity in a context free of social or political domination. In the context of risk communication, discourse provides a platform to resolve conflict or engage in joint problem-solving by a specific set of rules.

Risk: uncertainty that surrounds future events and outcomes. Expression of the likelihood and impact of an event with the potential to influence positively or negatively.

Risk mitigation: actions to reduce the severity/impact of a risk.

Risk comparison: the practice of comparing one risk to another in order to promote a better understanding of the nature and scope of the hazard.

Risk amplification: a heightening of interest in a risk issue created by various factors including increased media coverage.

Risk analysis: a process defined by the Codex Alimentarius model which includes three major activities: risk communication, risk assessment and risk management.

Social Union Framework Agreement: a framework agreement signed in 1999 between the Government of Canada and the governments of the provinces and territories, designed to improve the social union for Canadians.

Technical view: the view that providing rational or factual information to increase the knowledge level of the public will change what are judged by some, to be the public's "irrational" opinions.

Transparency: free from pretense or deceit.

Unreal optimism: see "optimistic bias" above.

Xenophobia: intolerance of the unfamiliar.